

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Perennial |                           |
| <b>Stream ID:</b> #9B(44)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23695                            | <b>Long:</b> -87.35536 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Raj, Josh                 |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 3:39 PM           | 404 Functional Assessment |

|  |   |  |   |  |  |  |
|--|---|--|---|--|--|--|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b>  |  | <b>Past 24-Hours</b>  |  | <b>Heavy rain in last 7-days</b>   |  |
|  | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   |  | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny |  | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b>   |  |
|  |   |  |   |  |  |  |
|  |   |  |   |  |  |  |
| <b>SITE LOCATION/MAP</b> See Attachment      |   |  |   |  |  |  |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other |  |   |  | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.76<br><b>Km<sup>2</sup></b> 2.0  |  |
|  |   |  |   |  |  |  |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 100% _____<br><input type="checkbox"/> Residential  |  |   |  | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |  |
|  |   |  |   |  |  |  |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and redord the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Shrub line, ag field   |  |   |  |  |  |
|  |   |  |   |  |  |  |
| <b>INSTREAM FEATURES</b>                     | Est. Reach Length ft 1319 m 402<br>Est. Stream Width ft m 0.0<br>Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Est. Water Depth in 3.0 m 0.1<br>Surface Velocity ft/s 24.0 m/s 7.3  |  |   |  | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |  |
|  | Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |  |   |  |  |  |
|  |   |  |   |  |  |  |
|  |   |  |   |  |  |  |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |  |   |  |  |  |
|  |   |  |   |  |  |  |

|  |                 |   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|-------------------------------------|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><div><input type="checkbox"/> Rooted Emergent    <input type="checkbox"/> Rooted Submergent    <input type="checkbox"/> Rooted Floating    <input checked="" type="checkbox"/> None<br/><input type="checkbox"/> Free Floating    <input type="checkbox"/> Attached Algae    <input type="checkbox"/> Floating Algae</div> <div>Portion of the reach with aquatic vegetation present    <div>0</div>%</div>   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature    15 °C    59 F    Water Odors<br>Conductivity    μs/cm <div>668</div> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <div>474</div> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <div>8.0</div><br>Turbidity <input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input checked="" type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other<br>Water Surface Oils  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <div><b>Odors</b><br/><input checked="" type="checkbox"/> Normal    <input type="checkbox"/> Sewage    <input type="checkbox"/> Petroleum    <input type="checkbox"/> Sludge    <input type="checkbox"/> Sawdust    <input type="checkbox"/> Paper fiber    <input type="checkbox"/> Sand<br/><input type="checkbox"/> Chemical    <input type="checkbox"/> Anaerobic    <input type="checkbox"/> None    <input type="checkbox"/> Relic Shells    <input type="checkbox"/> Other<br/><input type="checkbox"/> Other</div> <div><b>Deposits</b><br/><input type="checkbox"/> Sludge    <input type="checkbox"/> Sawdust    <input type="checkbox"/> Paper fiber    <input type="checkbox"/> Sand<br/><input type="checkbox"/> Relic Shells    <input type="checkbox"/> Other</div> <div>Looking at stones which are not deeply embedded, are undersides black in color?<br/><input checked="" type="checkbox"/> Absent    <input type="checkbox"/> Slight    <input type="checkbox"/> Moderate    <input type="checkbox"/> Profuse    <input type="checkbox"/> Yes    <input type="checkbox"/> No</div> |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                                     |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite inSampling Reach</b>   |                          |                          |                          | <b>Substrate Type</b>   | <b>Characteristic</b>               |                          |                          |  | <b>% Composition in Sampling Reach</b> |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Bedrock  |                 |   |                          |                          |                          | Detritus  | Sticks, wood, coarse plant material |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Cobble   | 2.5 - 10"       | 5   |                          |                          |                          | Muck- Mud   | Black very fine organic matter      |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Gravel   | 0.1 - 2.5"      | 50  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Sand   | gritty          | 30  |                          |                          |                          | Marl  | Grey, shell fragments               |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Silt   | gooeey          | 15  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| Clay   | slick           |   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |   |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                                     |                          |                          | <b>Marginal</b>  |  |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                          |   |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                                     |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |  |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                          |   |   |   |
| <b>Score</b>                                   | <b>14</b>       | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                                  | 14                       | 13                       | 12   | 11                                     | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                        | 2 | 1 | 0 |

|   |           |   |   |   |  |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>10</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                                  | 12                       | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>10</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                                  | 12                       | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>15</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                                  | 12                       | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                                  | 12                       | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                                  | 12                       | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |

|   |            |   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                                     |                          |                                     |                          |   |                          |                          |                          |                          |                          |                          |
|---|------------|---|--------------------------|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|-------------------------------------|--------------------------|-------------------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |            | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                                     |                          |                                     |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>7</b>   | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |            | 20  | 19                       | 18                       | 17                       | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                                   | 8                        | 7                                   | 6                        | 5   | 4                        | 3                        | 2                        | 1                        | C                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |            | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                                     |                          |                                     |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |            | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                                     |                          |                                     |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>4</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |            | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                                     |                          |                                     |                          | Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>   |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |                          |                          |
|   |            | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        |                          | 2  | 1                                   | C                        |                                     |                          |   |                          |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>109</b> |   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                                     |                          |                                     |                          |   |                          |                          |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Perennial |                           |
| <b>Stream ID:</b> #9B(45)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23665                            | <b>Long:</b> -87.35639 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Raj, Josh                 |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b>                   | 404 Functional Assessment |

|                                |  |   |  |               |
|--------------------------------|--|---|--|---------------|
| <b>WEATHER CONDITIONS</b>      | <b>Current</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes  |               |
|                                |  |   | <b>Air Temp °C</b><br><b>Air Temp °F</b> 65  | <b>Other:</b> |
| <b>SITE LOCATION/MAP</b>       | <b>See Attachment</b>  |   |  |               |
| <b>STREAM CHARACTERIZATION</b> | <b>Stream Subsystem</b><br><input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral  |   | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater  |               |
|                                | <b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  |   | <b>Catchment Area</b><br><b>Mile<sup>2</sup></b><br><b>Km<sup>2</sup></b> 0.0  |               |
| <b>WATERSHED FEATURES</b>      | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture ### _____<br><input type="checkbox"/> Residential  |   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |               |
|                                | <b>RIPARIAN VEGETATION (18 meter buffer)</b><br><b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Shrub line, ag field. |   |  |               |
| <b>INSTREAM FEATURES</b>       | Est. Reach Length ft m 0<br>Est. Stream Width ft m 0.0<br>Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Est. Water Depth in 24.0 m 0.6<br>Surface Velocity ft/s 3.0 m/s 0.9              |   | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |               |
|                                | Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |               |
| <b>LARGE WOODY DEBRIS</b>      | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup>  |   |  |               |
|                                | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |               |



|   |           |   |   |   |  |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|---|-----------|---|---|---|--|--------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>11</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                                  | 13                       | 12                                  | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>10</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                                  | 13                       | 12                                  | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>14</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                                  | 13                       | 12                                  | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                                  | 13                       | 12                                  | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                                     |                                     |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                                  | 13                       | 12                                  | 11                                  | 10                       | 9                        | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |

|   |          |   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                                     |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                       | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                        | 7                                   | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                                     |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                                     |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>2</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>2</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                                     |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>98</b>   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #13(32)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23338                            | <b>Long:</b> -87.34459 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 3:56 PM           | 404 Functional Assessment |

|  |   |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
|--|---|---|--|---|----|---|---|---------------------|-------------------|----|---|-----|---------------------|-----------------|---|------------------|---|---------------------------------|-------------------|-----|---------------------|--|-------------------------|-------------------|-----|---------------------|-------------------------|------------------|----|-----|-------|------------------------|------------------|------|-----|-----------|------------------------|-------------|---|--|--|--|-------------|---|--|--|---|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br>Mile <sup>2</sup> 0.01<br>Km <sup>2</sup> 0.0  |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Other<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Agriculture <b>80% <u>Logged mine land</u></b><br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Herbaceous logged corridor, ag field, mining haul road   |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>m</td> <td>0</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup> 0</td> <td><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup> 0.0</td> <td><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup> 0.0</td> <td>High Water Mark ft 0.00</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>1.0</td> <td>m 0.0</td> <td>High Water Mark m 0.00</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s #####</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="2"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="2"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="4"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length   | ft | m | 0 | <b>Canopy Cover</b> | Est. Stream Width | ft | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> 0 | <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> 0.0 | <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> 0.0 | High Water Mark ft 0.00 | Est. Water Depth | in | 1.0 | m 0.0 | High Water Mark m 0.00 | Surface Velocity | ft/s | n/a | m/s ##### | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft  | m   | 0  | <b>Canopy Cover</b>   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Est. Stream Width                            | ft  | m   | 0.0  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup> 0   | <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup> 0.0  | <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded        |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup> 0.0  | High Water Mark ft 0.00   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Est. Water Depth                             | in  | 1.0   | m 0.0  | High Water Mark m 0.00  |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Surface Velocity                             | ft/s  | n/a   | m/s #####  | % of Stream Morphology  |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %              |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool           |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
|  |   |   |  | <input type="checkbox"/> Step Pool Series                                     |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 1.4 m <sup>2</sup> 15 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000013935 ft <sup>2</sup> /mile <sup>2</sup> 0.0000005381  |   |  |   |    |   |   |                     |                   |    |   |     |                     |                 |   |                  |   |                                 |                   |     |                     |  |                         |                   |     |                     |                         |                  |    |     |       |                        |                  |      |     |           |                        |             |   |  |  |  |             |   |  |  |   |  |  |  |  |   |

|  |                 |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;"><b>25</b>%</span>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>21.4 °C</b> <b>70.5 °F</b> Water Odors<br>Conductivity $\mu\text{s/cm}$ <b>519</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <b>367</b> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <b>8.1</b><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input checked="" type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other                  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Bedrock  |                 |   |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 5   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Sand   | gritty          | 30  |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Silt   | gooey           | 65  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Clay   | slick           |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Score</b>                                   | <b>3</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |

|   |           |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
|---|-----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|-------------------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                                     |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                                   | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                                     |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                                     |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                                     |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>72</b> |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                                     |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #13(33)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23346                            | <b>Long:</b> -87.34615 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 4:04 PM           | 404 Functional Assessment |

|  |   |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
|--|---|---|--|-------------------|--|------|---|-----|--|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|------------------|----|-----|---|-----|------------------|------|-----|-----|-----|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.1<br><b>Km<sup>2</sup></b> 0.3   |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 5% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other 25%<br><input checked="" type="checkbox"/> Agriculture 70% <u>Logged area</u><br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Logged corridor, ag field, mining haul road  |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>1296</td> <td>m</td> <td>395</td> <td rowspan="7"> <b>Canopy Cover</b><br/> <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br/><br/> High Water Mark ft 0.00<br/> High Water Mark m 0.00<br/> % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series </td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>3.0</td> <td>m</td> <td>0.1</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.2</td> <td>m/s</td> <td>0.1</td> </tr> </table><br>Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length | ft   | 1296 | m | 395 | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in | 3.0 | m | 0.1 | Surface Velocity | ft/s | 0.2 | m/s | 0.1 |
| Est. Reach Length                            | ft  | 1296  | m  | 395               | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Est. Stream Width                            | ft  |   | m  | 0.0               |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0                 |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Est. Water Depth                             | in  | 3.0   | m  | 0.1               |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Surface Velocity                             | ft/s  | 0.2   | m/s  | 0.1               |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.5 m <sup>2</sup> 5 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000004645 ft <sup>2</sup> /mile <sup>2</sup> 0.0000001794   |   |  |                   |  |      |   |     |  |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |

|  |                 |  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
|--|-----------------|--|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input checked="" type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;"><b>35</b>%</span>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>16.1</b> °C <b>61</b> °F    Water Odors<br>Conductivity    μs/cm <b>214</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <b>152</b> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <b>6.8</b><br>Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other<br>Water Surface Oils<br><input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Other |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Deposits</b><br>Looking at stones which are not deeply embedded, are undersides black in color?<br><b>Oils</b><br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |  |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>   |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Bedrock  |                 |  |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Boulder  | >10"            |  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |  |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 15   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Sand   | gritty          | 20   |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Silt   | gooey           | 60   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| Clay   | slick           | 5  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                                     |                          |                          |                          |                          |   |   |
|  |                 | <b>Optimal</b>   |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                                     |                          |                          |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                                     |                          |                          |                          |                          |   |   |
| <b>Score</b>                                   | <b>4</b>        | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20   | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |           |   |                          |                          |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|-----------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                       | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>81</b> |   |                          |                          |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                       |                                |                           |
|---|-----------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                       | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #13A                          |                       | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23294                            | <b>Long:</b> -87.3458 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will                      |                       |                                |                           |
| <b>Signature:</b>                               |                       | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                       | <b>Time:</b> 3:49 PM           | 404 Functional Assessment |

|   |   |   |   |  |
|---|---|---|---|--|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b>  | <b>Past 24-Hours</b>                              | <b>Heavy rain in last 7-days</b>  |  |
|   | <input type="checkbox"/> Storm (Heavy Rain)   | <input type="checkbox"/> Storm (Heavy Rain)       | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes                                       |  |
|   | <input type="checkbox"/> Rain Steady  | <input type="checkbox"/> Rain Steady              | <b>Air Temp °C</b> 18   |  |
|   | <input type="checkbox"/> Showers (Intermittent)   | <input type="checkbox"/> Showers (Intermittent)   | <b>Air Temp °F</b> 65   |  |
|   | <input type="checkbox"/> Cloud Cover %  | <input checked="" type="checkbox"/> Cloud Cover % | 90 <b>Other:</b>  |  |
|   | <input checked="" type="checkbox"/> Clear/Sunny   | <input type="checkbox"/> Clear/Sunny              |   |  |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |   |   |  |
| <b>STREAM CHARACTERIZATION</b>  | <b>Stream Subsystem</b>   |   | <b>Stream Type</b>  |  |
|   | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral  |   | <input type="checkbox"/> Coldwater  |  |
|   |   |   | <input checked="" type="checkbox"/> Warmwater   |  |
|   | <b>Stream Origin</b>  |   | <b>Catchment Area</b>   |  |
|   | <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins   |   | <b>Mile<sup>2</sup></b> 0.04  |  |
|   | <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  |   | <b>Km<sup>2</sup></b> 0.1   |  |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b>  |   | <b>Local Watershed NPS Pollution</b>  |  |
|   | <input checked="" type="checkbox"/> Forest 15% <input type="checkbox"/> Commercial  |   | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources                      |  |
|   | <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other   |   | <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b>                           |  |
|   | <input checked="" type="checkbox"/> Agriculture 85% _____   |   | <b>Local Watershed Erosion</b>  |  |
|   | <input type="checkbox"/> Residential  |   | <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |  |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>                                    | <b>Indicate the dominant type and record the dominant species present</b>   |   |   |  |
|   | <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None |   |   |  |
|   | <b>Dominant Species:</b> Soft mast forest, ag field   |   |   |  |
| <b>INSTREAM FEATURES</b>  | <b>Canopy Cover</b>   |   |   |  |
|   | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open  |   |   |  |
|   | <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded   |   |   |  |
|   | High Water Mark ft 0.00   |   |   |  |
|   | High Water Mark m 0.00  |   |   |  |
|   | % of Stream Morphology  |   |   |  |
|   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %  |   |   |  |
|   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool   |   |   |  |
|   | <input type="checkbox"/> Step Pool Series   |   |   |  |
|   | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |   |  |
| Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |   |   |  |
| <b>LARGE WOODY DEBRIS</b>   | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup>   |   |   |  |
|   | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |   |   |  |

|  |                 |  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
|--|-----------------|--|--------------------------|--------------------------|--------------------------|--------------------------|---|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--|--|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="border: 1px solid black; padding: 0 5px;">0</span> %  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>16 °C</b> <b>61 °F</b> Water Odors<br>Conductivity $\mu\text{s/cm}$ <span style="border: 1px solid black; padding: 0 5px;">210</span> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; padding: 0 5px;">149</span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; padding: 0 5px;">7.7</span><br>Turbidity    Water Surface Oils<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |  |                          |                          |                          |                          |   |                                     |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>   |                          |                          |                          |                          | <b>Substrate Type</b>   | <b>Characteristic</b>               |                          |                                     |                          |  | <b>% Composition in Sampling Reach</b> |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Bedrock  |                 |  |                          |                          |                          |                          | Detritus  | Sticks, wood, coarse plant material |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Boulder  | >10"            |  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Cobble   | 2.5 - 10"       |  |                          |                          |                          |                          | Muck-Mud  | Black very fine organic matter      |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Gravel   | 0.1 - 2.5"      | 5  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Sand   | gritty          | 55   |                          |                          |                          |                          | Marl  | Grey, shell fragments               |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Silt   | gooeey          | 40   |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| Clay   | slick           |  |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>   |                          |                          |                          |                          |   |                                     |                          |                                     |                          |  |  |                          |                          |                                     |  |                          |                          |                          |                          |                          |
|  |                 | <b>Optimal</b>   |                          |                          |                          |                          | <b>SubOptimal</b>   |                                     |                          |                                     |                          | <b>Marginal</b>  |  |                          |                          |                                     | <b>Poor</b>  |                          |                          |                          |                          |                          |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                                     |                          |                                     |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |  |                          |                          |                                     | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                          |
| <b>Score</b>                                   | <b>6</b>        | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>               | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  |                 | 20   | 19                       | 18                       | 17                       | 16                       | 15  | 14                                  | 13                       | 12                                  | 11                       | 10   | 9                                      | 8                        | 7                        | 6                                   | 5  | 4                        | 3                        | 2                        | 1                        | 0                        |

|   |           |   |   |   |  |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
|---|-----------|---|---|---|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>15</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>11</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                                     |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                                  | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |

|   |          |   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                       | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>3</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>96</b>   |                          |                          |                          |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                |                           |  |
|---|--------------|-------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                         | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #13B                          |              |                         | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23262                            | <b>Long:</b> | -87.34606               | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Will                      |              |                         |                                |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 5-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 2:16 PM    |                                | 404 Functional Assessment |  |

|  |   |  |   |  |  |  |
|--|---|--|---|--|--|--|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b>  |  | <b>Past 24-Hours</b>  |  | <b>Heavy rain in last 7-days</b>   |  |
|  | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   |  | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny |  | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b>   |  |
|  |   |  |   |  |  |  |
|  |   |  |   |  |  |  |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |  |   |  |  |  |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b>   |  |   | <b>Stream Type</b>   |  |  |
|  | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other |  |   | <input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.02<br><b>Km<sup>2</sup></b> 0.1  |  |  |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b>  |  |   | <b>Local Watershed NPS Pollution</b>   |  |  |
|  | <input checked="" type="checkbox"/> Forest 5% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 95%<br><input type="checkbox"/> Residential   |  |   | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |  |  |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast riparian corridor  |  |   |  |  |  |
| <b>INSTREAM FEATURES</b>                     | Est. Reach Length ft 465 m 142<br>Est. Stream Width ft m 0.0<br>Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Est. Water Depth in 1.0 m 0.0<br>Surface Velocity ft/s 0.5 m/s 0.2                          |  |   |  | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |  |
|  | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |  |   |  |  |  |
|  |   |  |   |  |  |  |
|  |   |  |   |  |  |  |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |  |   |  |  |  |
|  |   |  |   |  |  |  |

|  |                 |   |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|-------------------------------------|--|--------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>WATER QUALITY</b>                           |                 | Temperature    17 °C    63 °F    Water Odors<br>Conductivity    μs/cm    332 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    237 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    7.8<br>Turbidity    Water Surface Oils<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          | <b>Substrate Type</b>   | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Bedrock  |                 |   |                          |                          |                          | Detritus  | Sticks, wood, coarse plant material |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Boulder  | >10"            |   |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          | Muck-Mud  | Black very fine organic matter      |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Gravel   | 0.1 - 2.5"      | 10  |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Sand   | gritty          | 70  |                          |                          |                          | Marl  | Grey, shell fragments               |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Silt   | gooey           | 20  |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Clay   | slick           |   |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                                     |  |                          |  |                          |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                                     |  |                          | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                                     |  |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                                   | <b>6</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/>               | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                                  | 14                                     | 13                       | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |

|   |           |   |   |   |  |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
|---|-----------|---|---|---|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>14</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              |           | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>7</b>                                  |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |

|   |          |   |                          |                          |                          |                          |  |                          |                          |                                     |                          |  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                                     |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                                     |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                       | 13                       | 12                                  | 11                       | 10   | 9                        | 8                        | 7                                   | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                                     |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                                     |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                                     |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                                     |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                                     |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                                     |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>2</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>3</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>82</b>   |                          |                          |                          |                          |  |                          |                          |                                     |                          |  |                          |                          |                                     |                                     |   |                          |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                  |                                |                           |
|---|------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2   |                  | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #13B(38)                        |                  | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38                                    | <b>Long:</b> -87 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Josh Iddings, Rajesh Poudel |                  |                                |                           |
| <b>Signature:</b>                                 |                  | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                  | <b>Time:</b> 5:57 PM           | 404 Functional Assessment |

|  |   |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
|--|---|---|--|---|----|---|---|---|-------------------|----|---|-----|---------------------|-----------------|---|------------------|---------------------------------|-------------------|-----|---------------------|-------------------------|-------------------|-----|---------------------|------------------|----|---|-----|------------------|------|-----|-----------|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.01<br><b>Km<sup>2</sup></b> 0.0  |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other 100<br><input type="checkbox"/> Agriculture <u>Haul road</u><br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Perennial grass  |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>m</td> <td>0</td> <td rowspan="7"> <b>Canopy Cover</b><br/> <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/><br/> High Water Mark ft 0.00<br/> High Water Mark m 0.00<br/> % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series </td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup> 0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup> 0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup> 0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s #####</td> </tr> </table><br>Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length   | ft | m | 0 | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | Est. Stream Width | ft | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> 0 | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> 0.0 | Est. Water Depth | in | m | 0.0 | Surface Velocity | ft/s | n/a | m/s ##### |
| Est. Reach Length                            | ft  | m   | 0  | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Est. Stream Width                            | ft  | m   | 0.0  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup> 0   |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup> 0.0  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup> 0.0  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Est. Water Depth                             | in  | m   | 0.0  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| Surface Velocity                             | ft/s  | n/a   | m/s #####  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |   |    |   |   |   |                   |    |   |     |                     |                 |   |                  |                                 |                   |     |                     |                         |                   |     |                     |                  |    |   |     |                  |      |     |           |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 40px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 |   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            | 10  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       | 10  |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 50  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          | 30  |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooey           |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>8</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
|---|----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                                     |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                                   | 5   | 4                        | 3                        | 2                                   | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                                     |                          |
| <b>Score (LB)</b>   | <b>1</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>Score (RB)</b>   | <b>1</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> |                                     |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                                     |                          |
| <b>Score (LB)</b>   | <b>0</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>Score (RB)</b>   | <b>0</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                                     |                          |
| <b>Score (LB)</b>   | <b>1</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>Score (RB)</b>   | <b>0</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |
| <b>TOTAL SCORE</b>  |          | <b>42</b>   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                                     |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #14(8A)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23104                            | <b>Long:</b> -87.35141 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 4:21 PM           | 404 Functional Assessment |

|   |  |  |   |   |   |    |
|---|--|--|---|---|---|----|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   |  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny |   | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes   |    |
|   |  |  |   |   | <b>Air Temp °C</b>  | 18 |
|   |  |  |   |   | <b>Air Temp °F</b>  | 65 |
|   |  |  |   |   | <b>Other:</b>   |    |
| <b>SITE LOCATION/MAP</b> See Attachment   |  |  |   |   |   |    |
| <b>STREAM CHARACTERIZATION</b>  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other |  |   |   | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater   |    |
|   |  |  |   |   | <b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.05<br><b>Km<sup>2</sup></b> 0.1  |    |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 80% <u>Logged</u><br><input type="checkbox"/> Residential   |  |   |   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br>20 <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |    |
|   |  |  |   |   |   |    |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>                                    | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Logged corridor, ag field, mining haul road   |  |   |   |   |    |
|   |  |  |   |   |   |    |
| <b>INSTREAM FEATURES</b>  | Est. Reach Length ft 785 m 239   |  |   |   | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC   |    |
|   | Est. Stream Width ft m 0.0   |  |   |   |   |    |
|   | Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0   |  |   |   |   |    |
|   | Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0  |  |   |   |   |    |
|   | Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0  |  |   |   | High Water Mark ft 0.00   |    |
|   | Est. Water Depth in m 0.0  |  |   |   | High Water Mark m 0.00  |    |
|   | Surface Velocity ft/s n/a m/s #####  |  |   |   | % of Stream Morphology  |    |
|   | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |  |   |   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %  |    |
| Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |   |    |
|   |  |  |   | <input type="checkbox"/> Step Pool Series                           |   |    |
| <b>LARGE WOODY DEBRIS</b>   | LWD 0.0 m <sup>2</sup> 0 ft <sup>2</sup>   |  |   |   |   |    |
|   | Density of LWD m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |  |   |   |   |    |

|                                       |                 |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|--|--|--|-------------------------------------|-------------------------------------|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">60%</span>  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |  |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  |  |  |  | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  |  |  |  | Detritus                            | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  |  |  |  | Muck-Mud                            | Black very fine organic matter      |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 5   |  |  |  |  |  | Marl                                | Grey, shell fragments               |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 85  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 10  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |
| <b>Score</b>                                   | <b>1</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1                                   | 0                        |

|   |           |   |   |   |  |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>11</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                                  | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |

|   |           |   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|-----------|---|--------------------------|-------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                                  | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>59</b> |   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #15                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23262                            | <b>Long:</b> -87.36085 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 5:47 PM           | 404 Functional Assessment |

|   |   |   |  |   |   |
|---|---|---|--|---|---|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |   |   |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |   |  |   |   |
| <b>STREAM CHARACTERIZATION</b>  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br>Mile <sup>2</sup> 0.02<br>Km <sup>2</sup> 0.1  |   |  |   |   |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 5% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other 50<br><input checked="" type="checkbox"/> Agriculture 45% <u>Logged</u><br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |   |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>  | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Riparian corridor  |   |  |   |   |
| <b>INSTREAM FEATURES</b>  | <table style="width: 100%;"> <tr> <td style="width: 50%;"> Est. Reach Length ft 166 m 51<br/> Est. Stream Width ft m 0.0<br/> Sampling Reach Area ft<sup>2</sup> 0 m<sup>2</sup> 0<br/> Sampling Area mile<sup>2</sup> mile<sup>2</sup> 0.0 km<sup>2</sup> 0.0<br/> Area in km<sup>2</sup> mile<sup>2</sup> 0.0 km<sup>2</sup> 0.0<br/> Est. Water Depth in 1.0 m 0.0<br/> Surface Velocity ft/s 0.1 m/s 0.0 </td> <td style="width: 50%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/> High Water Mark ft 0.00<br/> High Water Mark m 0.00<br/> % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series </td> </tr> </table> Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length ft 166 m 51<br>Est. Stream Width ft m 0.0<br>Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Est. Water Depth in 1.0 m 0.0<br>Surface Velocity ft/s 0.1 m/s 0.0 | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |
| Est. Reach Length ft 166 m 51<br>Est. Stream Width ft m 0.0<br>Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0<br>Est. Water Depth in 1.0 m 0.0<br>Surface Velocity ft/s 0.1 m/s 0.0 | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series   |   |  |   |   |
| <b>LARGE WOODY DEBRIS</b>   | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |   |   |

|                                       |                 |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|--|--|--|-------------------------------------|-------------------------------------|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">5%</span>   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature    17.2 °C    63 °F    Water Odors<br>Conductivity    μs/cm    198.1 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    141 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    7.3<br>Turbidity    Water Surface Oils<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |  |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  |  |  |  | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  |  |  |  | Detritus                            | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  |  |  |  | Muck-Mud                            | Black very fine organic matter      |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      | 5   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 55  |  |  |  |  |  | Marl                                | Grey, shell fragments               |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 40  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Clay                                  | slick           |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |                          |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                                     |                          |                          |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                                     |                          |                          |                          |   |
| <b>Score</b>                                   | <b>3</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1                        | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                          |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1                        | 0                        |

|   |           |   |                          |                          |                                     |                          |  |                                     |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
|---|-----------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|---|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                                     |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |   |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19                       | 18                       | 17                                  | 16                       | 15   | 14                                  | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1 |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                                     |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                                     |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                                     |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                                     |   |                          |                          |                          |   |
| <b>TOTAL SCORE</b>  | <b>83</b> |   |                          |                          |                                     |                          |  |                                     |                          |                          |                          |  |                          |                                     |                          |                                     |   |                          |                          |                          |   |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #15A                          |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23254                            | <b>Long:</b> -87.36054 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will                      |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 5:52 PM           | 404 Functional Assessment |

|  |   |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
|--|---|---|--|-------------------|---|-----|---|-----|---|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|------------------|----|-----|---|-----|------------------|------|-----|-----|-----|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.02<br><b>Km<sup>2</sup></b> 0.1  |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 10% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other<br><input type="checkbox"/> Agriculture <u>Logged</u><br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br>90 <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Logged area  |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>549</td> <td>m</td> <td>167</td> <td rowspan="7"> <b>Canopy Cover</b><br/> <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/><br/>           High Water Mark ft 0.00<br/>           High Water Mark m 0.00<br/>           % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series         </td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>0.3</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.5</td> <td>m/s</td> <td>0.2</td> </tr> </table><br>Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length | ft  | 549 | m | 167 | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in | 0.3 | m | 0.0 | Surface Velocity | ft/s | 0.5 | m/s | 0.2 |
| Est. Reach Length                            | ft  | 549   | m  | 167               | <b>Canopy Cover</b><br><input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Est. Stream Width                            | ft  |   | m  | 0.0               |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0                 |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Est. Water Depth                             | in  | 0.3   | m  | 0.0               |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| Surface Velocity                             | ft/s  | 0.5   | m/s  | 0.2               |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 1.4 m <sup>2</sup> 15 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000013935 ft <sup>2</sup> /mile <sup>2</sup> 0.0000005381  |   |  |                   |   |     |   |     |   |                   |    |  |   |     |                     |                 |   |                |   |                                 |                   |     |                 |     |                         |                   |     |                 |     |                  |    |     |   |     |                  |      |     |     |     |

|                                       |                 |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|--|--|--|-------------------------------------|-------------------------------------|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br><br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature    13 °C    56 °F    Water Odors<br>Conductivity    μs/cm    205 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    144 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    7.5<br><br>Turbidity    Water Surface Oils<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |  |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  |  |  |  | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  |  |  |  | Detritus                            | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  |  |  |  | Muck-Mud                            | Black very fine organic matter      |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      | 5   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 50  |  |  |  |  |  | Marl                                | Grey, shell fragments               |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 45  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Clay                                  | slick           |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |                          |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                                     |                          |                          |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                                     |                          |                          |                          |   |
| <b>Score</b>                                   | <b>3</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1                        | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                                   | 3                        | 2                        | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                                   | 3                        | 2                        | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                                   | 3                        | 2                        | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
| <b>Score</b>                              | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                                   | 3                        | 2                        | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                                     |                          |                          |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                                   | 3                        | 2                        | 1                        | 0                        |

|   |           |   |                          |                          |                          |                          |  |                                     |                          |                          |                          |  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
|---|-----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|---|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                                     |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                                     |                          |                          |                          |                          |
| <b>Score</b>  | <b>5</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                                  | 13                       | 12                       | 11                       | 10   | 9                        | 8                        | 7                        | 6                        | 5   | 4                                   | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                                     |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                                     |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                                     |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                                     |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                                     |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                                     |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>67</b> |   |                          |                          |                          |                          |  |                                     |                          |                          |                          |  |                          |                          |                          |                          |   |                                     |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                       |                                |                           |
|---|-----------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                       | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #15B                          |                       | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23142                            | <b>Long:</b> -87.3615 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate                      |                       |                                |                           |
| <b>Signature:</b>                               |                       | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                       | <b>Time:</b> 5:35 PM           | 404 Functional Assessment |

|  |  |   |   |
|--|--|---|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><div style="display: flex; justify-content: space-between;"> <div><b>Air Temp °C</b></div> <div><b>18</b></div> </div> <div style="display: flex; justify-content: space-between;"> <div><b>Air Temp °F</b></div> <div><b>65</b></div> </div> <div><b>Other:</b></div> |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>  |   |   |
| <b>STREAM CHARACTERIZATION</b>               | <div style="display: flex; justify-content: space-between;"> <div> <b>Stream Subsystem</b><br/> <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br/><br/> <b>Stream Origin</b><br/> <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br/> <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other         </div> <div> <b>Stream Type</b><br/> <input type="checkbox"/> Coldwater<br/> <input checked="" type="checkbox"/> Warmwater<br/><br/> <b>Catchment Area</b><br/> <div style="display: flex; justify-content: space-between;"> <div><b>Mile<sup>2</sup></b></div> <div><b>0.02</b></div> </div> <div style="display: flex; justify-content: space-between;"> <div><b>Km<sup>2</sup></b></div> <div><b>0.1</b></div> </div> </div> </div>  |   |   |
| <b>WATERSHED FEATURES</b>                    | <div style="display: flex; justify-content: space-between;"> <div> <b>Surrounding Land use &amp; Percentage</b><br/> <input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br/> <input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other<br/> <input type="checkbox"/> Agriculture <u>Logged</u><br/> <input type="checkbox"/> Residential         </div> <div> <b>Local Watershed NPS Pollution</b><br/> <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br/> <b>100</b> <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br/> <b>Local Watershed Erosion</b><br/> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy         </div> </div>  |   |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Logged forest   |   |   |
| <b>INSTREAM FEATURES</b>                     | <div style="display: flex; justify-content: space-between;"> <div>           Est. Reach Length      ft      256      m      78<br/>           Est. Stream Width      ft           m      0.0<br/>           Sampling Reach Area      ft<sup>2</sup>      0      m<sup>2</sup>      0<br/>           Sampling Area mile<sup>2</sup>      mile<sup>2</sup>      0.0      km<sup>2</sup>      0.0<br/>           Area in km<sup>2</sup>      mile<sup>2</sup>      0.0      km<sup>2</sup>      0.0<br/>           Est. Water Depth      in      1.0      m      0.0<br/>           Surface Velocity      ft/s      0.2      m/s      0.1         </div> <div> <b>Canopy Cover</b><br/> <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/><br/>           High Water Mark      ft      0.00<br/>           High Water Mark      m      0.00<br/>           % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series         </div> </div> <div style="margin-top: 10px;">           Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br/>           Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         </div> |   |   |
| <b>LARGE WOODY DEBRIS</b>                    | <div style="display: flex; justify-content: space-between;"> <div> <b>LWD</b>      0.9      m<sup>2</sup>      10      ft<sup>2</sup><br/><br/> <b>Density of LWD</b>      m<sup>2</sup>/km<sup>2</sup>      0.0000009290      ft<sup>2</sup>/mile<sup>2</sup>      0.0000003587         </div> </div>   |   |   |

|  |                 |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input checked="" type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">25%</span>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>WATER QUALITY</b>                           |                 | Temperature    13 °C    55 °F    Water Odors<br>Conductivity    μs/cm    146.7 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    104 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    6.8<br>Turbidity    Water Surface Oils<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Bedrock  |                 |   |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Gravel   | 0.1 - 2.5"      | 10  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Sand   | gritty          | 20  |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Silt   | gooeey          | 70  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| Clay   | slick           |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                                     |                          |                          |                          |                          |                          |                          |                          |                          |                          |
| <b>Score</b>                                   | <b>5</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                                   | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0                        |                          |                          |

|   |           |   |   |   |  |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                                     |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                                  | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |           |   |                          |                          |                                     |                          |  |                          |                                     |                          |                          |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
|---|-----------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                                     |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                       | 17                                  | 16                       | 15   | 14                       | 13                                  | 12                       | 11                       | 10   | 9                        | 8                        | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                                     |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   |                          |                                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                                     |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                                   | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>78</b> |   |                          |                          |                                     |                          |  |                          |                                     |                          |                          |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #16                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23076                            | <b>Long:</b> -87.36165 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate                      |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 5:39 PM           | 404 Functional Assessment |

|   |   |   |   |                 |     |
|---|---|---|---|-----------------|-----|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b>  | <b>Past 24-Hours</b>                              | <b>Heavy rain in last 7-days</b>  |                 |     |
|   | <input type="checkbox"/> Storm (Heavy Rain)   | <input type="checkbox"/> Storm (Heavy Rain)       | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes                                       |                 |     |
|   | <input type="checkbox"/> Rain Steady  | <input type="checkbox"/> Rain Steady              | <b>Air Temp °C</b> 18   |                 |     |
|   | <input type="checkbox"/> Showers (Intermittent)   | <input type="checkbox"/> Showers (Intermittent)   | <b>Air Temp °F</b> 65   |                 |     |
|   | <input type="checkbox"/> Cloud Cover %  | <input checked="" type="checkbox"/> Cloud Cover % | 90 <b>Other:</b>  |                 |     |
|   | <input checked="" type="checkbox"/> Clear/Sunny   | <input type="checkbox"/> Clear/Sunny              |   |                 |     |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |   |   |                 |     |
| <b>STREAM CHARACTERIZATION</b>                                      | <b>Stream Subsystem</b>   |   | <b>Stream Type</b>  |                 |     |
|   | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral  |   | <input type="checkbox"/> Coldwater  |                 |     |
|   |   |   | <input checked="" type="checkbox"/> Warmwater   |                 |     |
|   | <b>Stream Origin</b>  |   | <b>Catchment Area</b>   |                 |     |
|   | <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins   |   | <b>Mile<sup>2</sup></b> 0.03  |                 |     |
|   | <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  |   | <b>Km<sup>2</sup></b> 0.1   |                 |     |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b>  |   | <b>Local Watershed NPS Pollution</b>  |                 |     |
|   | <input type="checkbox"/> Forest <input type="checkbox"/> Commercial   |   | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources                      |                 |     |
|   | <input type="checkbox"/> Field/Pasture <input checked="" type="checkbox"/> Other  |   | 100 <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b>                       |                 |     |
|   | <input type="checkbox"/> Agriculture <u>Logged</u>  |   | <b>Local Watershed Erosion</b>  |                 |     |
|   | <input type="checkbox"/> Residential  |   | <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |                 |     |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>                        | <b>Indicate the dominant type and record the dominant species present</b>   |   |   |                 |     |
|   | <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbs <input type="checkbox"/> None |   |   |                 |     |
|   | <b>Dominant Species:</b> Logged forest  |   |   |                 |     |
| <b>INSTREAM FEATURES</b>  | <b>Canopy Cover</b>   |   |   |                 |     |
|   | Est. Reach Length   | ft  | 503   | m               | 153 |
|   | Est. Stream Width   | ft  |   | m               | 0.0 |
|   | Sampling Reach Area   | ft <sup>2</sup>                                   | 0   | m <sup>2</sup>  | 0   |
|   | Sampling Area mile <sup>2</sup>   | mile <sup>2</sup>                                 | 0.0   | km <sup>2</sup> | 0.0 |
|   | Area in km <sup>2</sup>   | mile <sup>2</sup>                                 | 0.0   | km <sup>2</sup> | 0.0 |
|   | Est. Water Depth  | in  | 0.5   | m               | 0.0 |
|   | Surface Velocity  | ft/s  | 0.1   | m/s             | 0.0 |
|   | High Water Mark ft 0.00   |   |   |                 |     |
|   | High Water Mark m 0.00  |   |   |                 |     |
| % of Stream Morphology  |   |   |   |                 |     |
| <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %    |   |   |   |                 |     |
| <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |   |   |   |                 |     |
| <input type="checkbox"/> Step Pool Series                           |   |   |   |                 |     |
| <b>LARGE WOODY DEBRIS</b>   | <b>LWD</b> 0.9 m <sup>2</sup> 10 ft <sup>2</sup>  |   |   |                 |     |
|   | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000009290 ft <sup>2</sup> /mile <sup>2</sup> 0.0000003587  |   |   |                 |     |

|  |                 |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">20 %</span>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature    14 °C    57 °F    Water Odors<br>Conductivity    μs/cm    90.3 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    66 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    7.8<br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Bedrock  |                 |   |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 10  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Sand   | gritty          | 15  |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Silt   | gooey           | 75  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Clay   | slick           |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Score</b>                                   | <b>3</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |   |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0 |

|   |           |   |                          |                          |                                     |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
|---|-----------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|---|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                                     |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | 20  | 19                       | 18                       | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                        | 7                        | 6                                   | 5   | 4                                   | 3                        | 2                        | 1                        |                          |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                                     |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                                     |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                                     |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |           | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  | <b>74</b> |   |                          |                          |                                     |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                                     |   |                                     |                          |                          |                          |                          |  |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                   |                           |  |
|---|--------------|-------------------------|-----------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                         | <b>Stream Class:</b> Intermittent |                           |  |
| <b>Stream ID:</b> #17                           |              |                         | <b>Location:</b> Mackey, IN       |                           |  |
| <b>Lat:</b> 38.23737                            | <b>Long:</b> | -87.35481               | <b>River Basin:</b>               | Ohio                      |  |
| <b>Investigators:</b> Raj, Josh                 |              |                         |                                   |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 5-May-2011 |                                   | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 3:20 PM    |                                   | 404 Functional Assessment |  |

|   |   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
|---|---|---|--|---|--|-------------------------|-------------|-----------------------|-----------------------|-------------------------------------|---------------------|--|---------------------|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------------------|-------------------------|-------------------|-----------------|-----------------|-------------------------|-------------------|-----|-----------------|-----|------------------|------------------|------|-----|-----|------------------|--|-----------------|-----|------|--|-----------------|------|------|-----------------|---|------|--|--|--|--|--|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><table style="width: 100%;"> <tr> <td><b>Air Temp °C</b></td> <td style="text-align: center;"><b>18</b></td> </tr> <tr> <td><b>Air Temp °F</b></td> <td style="text-align: center;"><b>65</b></td> </tr> </table> <b>Other:</b> | <b>Air Temp °C</b>  | <b>18</b>  | <b>Air Temp °F</b>      | <b>65</b>   |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>Air Temp °C</b>  | <b>18</b>   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>Air Temp °F</b>  | <b>65</b>   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>STREAM CHARACTERIZATION</b>  | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Stream Subsystem</b><br/> <input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral<br/><br/> <b>Stream Origin</b><br/> <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br/> <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other           </td> <td style="width: 50%;"> <b>Stream Type</b><br/> <input type="checkbox"/> Coldwater<br/> <input checked="" type="checkbox"/> Warmwater<br/><br/> <b>Catchment Area</b><br/> <table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.22</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.6</b></td> </tr> </table> </td> </tr> </table>  |   |  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.22</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.6</b></td> </tr> </table> | <b>Mile<sup>2</sup></b> | <b>0.22</b> | <b>Km<sup>2</sup></b> | <b>0.6</b>            |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
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| <b>Mile<sup>2</sup></b>   | <b>0.22</b>   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>Km<sup>2</sup></b>   | <b>0.6</b>  |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>WATERSHED FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Surrounding Land use &amp; Percentage</b><br/> <input checked="" type="checkbox"/> Forest <b>10%</b> <input type="checkbox"/> Commercial<br/> <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br/> <input checked="" type="checkbox"/> Agriculture <b>90%</b><br/> <input type="checkbox"/> Residential           </td> <td style="width: 50%;"> <b>Local Watershed NPS Pollution</b><br/> <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br/> <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br/> <b>Local Watershed Erosion</b><br/> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy           </td> </tr> </table>  |   |  | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>10%</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture <b>90%</b><br><input type="checkbox"/> Residential  | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy         |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
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| <b>RIPARIAN VEGETATION (18 meter buffer)</b>  | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast tree line, ag field  |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>INSTREAM FEATURES</b>  | <table style="width: 100%;"> <tr> <td style="width: 60%;"> <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>828</td> <td>m</td> <td>252</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>5.0</td> <td>m</td> <td>0.1</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.2</td> <td>m/s</td> <td>0.1</td> </tr> </table> </td> <td style="width: 40%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded<br/><br/> <table style="width: 100%;"> <tr> <td>High Water Mark</td> <td>ft</td> <td>0.00</td> </tr> <tr> <td>High Water Mark</td> <td>m</td> <td>0.00</td> </tr> </table> <b>% of Stream Morphology</b><br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series           </td> </tr> <tr> <td colspan="5">           Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br/>           Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         </td> </tr> </table> |   |  | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>828</td> <td>m</td> <td>252</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>5.0</td> <td>m</td> <td>0.1</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.2</td> <td>m/s</td> <td>0.1</td> </tr> </table> | Est. Reach Length  | ft                      | 828         | m                     | 252                   | Est. Stream Width                   | ft                  |  | m                   | 0.0            | Sampling Reach Area | ft <sup>2</sup>                 | 0                 | m <sup>2</sup> | 0               | Sampling Area mile <sup>2</sup> | mile <sup>2</sup>       | 0.0               | km <sup>2</sup> | 0.0             | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in               | 5.0  | m   | 0.1 | Surface Velocity | ft/s   | 0.2             | m/s | 0.1  | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded<br><br><table style="width: 100%;"> <tr> <td>High Water Mark</td> <td>ft</td> <td>0.00</td> </tr> <tr> <td>High Water Mark</td> <td>m</td> <td>0.00</td> </tr> </table> <b>% of Stream Morphology</b><br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | High Water Mark | ft   | 0.00 | High Water Mark | m | 0.00 | Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  |  |
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| Est. Reach Length   | ft  | 828   | m  | 252   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Est. Stream Width   | ft  |   | m  | 0.0   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Sampling Reach Area   | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Sampling Area mile <sup>2</sup>   | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Area in km <sup>2</sup>   | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Est. Water Depth  | in  | 5.0   | m  | 0.1   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Surface Velocity  | ft/s  | 0.2   | m/s  | 0.1   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| High Water Mark   | ft  | 0.00  |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| High Water Mark   | m   | 0.00  |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| Channelized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |   |   |  |   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>LARGE WOODY DEBRIS</b>   | <table style="width: 100%;"> <tr> <td><b>LWD</b></td> <td><b>0.0</b></td> <td><b>m<sup>2</sup></b></td> <td><b>0</b></td> <td><b>ft<sup>2</sup></b></td> </tr> <tr> <td><b>Density of LWD</b></td> <td><b>m<sup>2</sup>/km<sup>2</sup></b></td> <td><b>0.0000000000</b></td> <td><b>ft<sup>2</sup>/mile<sup>2</sup></b></td> <td><b>0.0000000000</b></td> </tr> </table>  |   |  | <b>LWD</b>  | <b>0.0</b>   | <b>m<sup>2</sup></b>    | <b>0</b>    | <b>ft<sup>2</sup></b> | <b>Density of LWD</b> | <b>m<sup>2</sup>/km<sup>2</sup></b> | <b>0.0000000000</b> | <b>ft<sup>2</sup>/mile<sup>2</sup></b> | <b>0.0000000000</b> |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>LWD</b>  | <b>0.0</b>  | <b>m<sup>2</sup></b>  | <b>0</b>   | <b>ft<sup>2</sup></b>   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |
| <b>Density of LWD</b>   | <b>m<sup>2</sup>/km<sup>2</sup></b>   | <b>0.0000000000</b>   | <b>ft<sup>2</sup>/mile<sup>2</sup></b>   | <b>0.0000000000</b>   |  |                         |             |                       |                       |                                     |                     |  |                     |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |                 |     |      |  |                 |      |      |                 |   |      |  |  |  |  |  |



|   |           |   |   |   |  |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
|---|-----------|---|---|---|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                                  | 12                       | 11                       | 10                                  | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>9</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                                  | 12                       | 11                       | 10                                  | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>12</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                                  | 12                       | 11                       | 10                                  | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>14</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                                  | 12                       | 11                       | 10                                  | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                                     |                          |                                     |                          |                          |                                     |                                     |                          |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                              | <b>12</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                                  | 12                       | 11                       | 10                                  | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |

|   |           |   |                          |                          |                          |                          |  |                          |                          |                          |                                     |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
|---|-----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                                     | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                                  | 10   | 9                        | 8                        | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                                     | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>3</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                                     | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>2</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b>  |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>88</b> |   |                          |                          |                          |                          |  |                          |                          |                          |                                     |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                |                           |  |
|---|--------------|-------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2   |              |                         | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #17A                            |              |                         | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23733                              | <b>Long:</b> | -87.35475               | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Josh Iddings, Rajesh Poudel |              |                         |                                |                           |  |
| <b>Signature:</b>                                 |              | <b>Date:</b> 5-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 3:28 PM    |                                | 404 Functional Assessment |  |

|  |  |   |  |  |   |
|--|--|---|--|--|---|
| <b>WEATHER CONDITIONS</b>  | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |  |   |
| <b>SITE LOCATION/MAP</b>   | <b>See Attachment</b>  |   |  |  |   |
| <b>STREAM CHARACTERIZATION</b>   | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.01<br><b>Km<sup>2</sup></b> 0.0   |   |  |  |   |
| <b>WATERSHED FEATURES</b>  | <b>Surrounding Land use &amp; Percentage</b><br><input type="checkbox"/> Forest <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 100%<br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>   | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast tree line, ag field   |   |  |  |   |
| <b>INSTREAM FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> Est. Reach Length      ft      49      m      15<br/> Est. Stream Width      ft           m      0.0<br/> Sampling Reach Area      ft<sup>2</sup>      0      m<sup>2</sup>      0<br/> Sampling Area mile<sup>2</sup>      mile<sup>2</sup>      0.0      km<sup>2</sup>      0.0<br/> Area in km<sup>2</sup>      mile<sup>2</sup>      0.0      km<sup>2</sup>      0.0<br/> Est. Water Depth      in           m      0.0<br/> Surface Velocity      ft/s      n/a      m/s      ##### </td> <td style="width: 50%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/><br/> High Water Mark      ft      0.00<br/> High Water Mark      m      0.00<br/> % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series </td> </tr> </table><br>Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length      ft      49      m      15<br>Est. Stream Width      ft           m      0.0<br>Sampling Reach Area      ft <sup>2</sup> 0      m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Est. Water Depth      in           m      0.0<br>Surface Velocity      ft/s      n/a      m/s      ##### | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark      ft      0.00<br>High Water Mark      m      0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |
| Est. Reach Length      ft      49      m      15<br>Est. Stream Width      ft           m      0.0<br>Sampling Reach Area      ft <sup>2</sup> 0      m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Est. Water Depth      in           m      0.0<br>Surface Velocity      ft/s      n/a      m/s      ##### | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input checked="" type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark      ft      0.00<br>High Water Mark      m      0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series  |   |  |  |   |
| <b>LARGE WOODY DEBRIS</b>  | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |   |  |  |   |

|                                       |                 |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|-----------------------|-------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">10 %</span>   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 40px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |                       |                                     |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |  |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  | <b>Substrate Type</b> | <b>Characteristic</b>               |  |  | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  | Detritus              | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  | Muck-Mud              | Black very fine organic matter      |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 40  |  |  | Marl                  | Grey, shell fragments               |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 50  |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 10  |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                                     |                          |   |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                          |                                     |                          |  |                          |                          |                          |                                     |  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--|--------------------------|-------------------------------------|-------------------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                                     | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                                     |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                       | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                                  | 10   | 9                        | 8                                   | 7                                   | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                                     | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                                     |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                                     |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                                     | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                                     |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>2</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>2</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>79</b>   |                          |                          |                                     |                          |  |                          |                          |                          |                                     |  |                          |                                     |                                     |                          |   |                          |                          |                          |                          |  |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                          |                                |                           |  |
|---|--------------|--------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                          | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #18                           |              |                          | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23788                            | <b>Long:</b> | -87.35217                | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Nate Noland               |              |                          |                                |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 18-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 11:35 AM    |                                | 404 Functional Assessment |  |

|   |   |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
|---|---|--|--|-------------------------|---|-----------------------|-----|---------------|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|---|-------------------------|-------------------|-----|-----------------|-----|-------------------------|------------------|----|--|---|-----|------------------------|------------------|------|-----|-----|------|------------------------|---|--|--|--|--|--|---|--|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover % 20<br><input type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover % 90<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><table style="width: 100%;"> <tr> <td><b>Air Temp °C</b></td> <td>18</td> </tr> <tr> <td><b>Air Temp °F</b></td> <td>65</td> </tr> <tr> <td colspan="2"><b>Other:</b></td> </tr> </table> | <b>Air Temp °C</b>      | 18  | <b>Air Temp °F</b>    | 65  | <b>Other:</b> |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>Air Temp °C</b>  | 18  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>Air Temp °F</b>  | 65  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>Other:</b>   |   |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>  | See Attachment  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td>0.01</td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td>0.0</td> </tr> </table>   |  |  | <b>Mile<sup>2</sup></b> | 0.01  | <b>Km<sup>2</sup></b> | 0.0 |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>Mile<sup>2</sup></b>   | 0.01  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>Km<sup>2</sup></b>   | 0.0   |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 10% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 90% _____<br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>                                    | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Tree line, ag field  |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>  | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>75</td> <td>m</td> <td>23</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td><input type="checkbox"/> Open <input type="checkbox"/> Partly Open</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark ft 0.00</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> <td>High Water Mark m 0.00</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> <td>% of Stream Morphology</td> </tr> <tr> <td colspan="5">Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td colspan="5">Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="5"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |  |  | Est. Reach Length       | ft  | 75                    | m   | 23            | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark ft 0.00 | Est. Water Depth | in |  | m | 0.0 | High Water Mark m 0.00 | Surface Velocity | ft/s | n/a | m/s | #### | % of Stream Morphology | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length   | ft  | 75   | m  | 23                      | <b>Canopy Cover</b>   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width   | ft  |  | m  | 0.0                     |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area   | ft <sup>2</sup>   | 0  | m <sup>2</sup>   | 0                       | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open                |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>   | mile <sup>2</sup>   | 0.0  | km <sup>2</sup>  | 0.0                     | <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly Shaded |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>   | mile <sup>2</sup>   | 0.0  | km <sup>2</sup>  | 0.0                     | High Water Mark ft 0.00   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth  | in  |  | m  | 0.0                     | High Water Mark m 0.00  |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity  | ft/s  | n/a  | m/s  | ####                    | % of Stream Morphology  |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  |  |                         | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %                  |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  |  |                         | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool               |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
|   |   |  |  |                         | <input type="checkbox"/> Step Pool Series   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>   | <b>LWD</b> 0.5 m <sup>2</sup> 5 ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000004645 ft <sup>2</sup> /mile <sup>2</sup> 0.0000001794   |  |  |                         |   |                       |     |               |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |   |                         |                   |     |                 |     |                         |                  |    |  |   |     |                        |                  |      |     |     |      |                        |   |  |  |  |  |  |   |  |  |  |  |   |  |  |  |  |  |   |

|                                       |                 |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|--|--|--|-------------------------------------|-------------------------------------|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">10 %</span>   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 40px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |  |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  |  |  |  | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  |  |  |  | Detritus                            | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  |  |  |  | Muck-Mud                            | Black very fine organic matter      |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 45  |  |  |  |  |  | Marl                                | Grey, shell fragments               |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 50  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 5   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                                     |                          |   |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
| <b>Score</b>                              | <b>13</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                                     |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                                  | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0                        |

|   |          |   |                          |                          |                          |                          |  |                                     |                          |                                     |                                     |  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                                     |                          |                                     |                                     | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                                     |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                                  | 13                       | 12                                  | 11                                  | 10   | 9                                   | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                                     |                          |                                     |                                     | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                                     |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>4</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>3</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                                     |                          |                                     |                                     | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                                     |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>3</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>2</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                                     |                          |                                     |                                     | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                                     |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>5</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>5</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                                   | 4                        | 3                                   | 2                                   | 1  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>68</b>   |                          |                          |                          |                          |  |                                     |                          |                                     |                                     |  |                                     |                                     |                          |                          |   |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #19                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23728                            | <b>Long:</b> -87.35216 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 1:51 PM           | 404 Functional Assessment |

|  |  |   |   |
|--|--|---|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><div style="display: flex; justify-content: space-between;"> <div><b>Air Temp °C</b></div> <div><b>18</b></div> </div> <div style="display: flex; justify-content: space-between;"> <div><b>Air Temp °F</b></div> <div><b>65</b></div> </div> <div><b>Other:</b></div>   |
|  |  |   |   |
|  |  |   |   |
|  |  |   |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>  |   |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other   |   | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><div style="display: flex; justify-content: space-between;"> <div><b>Mile<sup>2</sup></b></div> <div><b>0.02</b></div> </div> <div style="display: flex; justify-content: space-between;"> <div><b>Km<sup>2</sup></b></div> <div><b>0.1</b></div> </div>  |
|  |  |   |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>15%</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture <b>85%</b> _____<br><input type="checkbox"/> Residential   |   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |
|  |  |   |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast forest, ag field  |   |   |
| <b>INSTREAM FEATURES</b>                     | Est. Reach Length      ft      568      m      173<br>Est. Stream Width      ft           m      0.0<br>Sampling Reach Area      ft <sup>2</sup> 0      m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0      km <sup>2</sup> 0.0<br>Est. Water Depth      in      1.0      m      0.0<br>Surface Velocity      ft/s      0.1      m/s      0.0 |   | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC<br><br>High Water Mark      ft      0.00<br>High Water Mark      m      0.00<br>% of Stream Morphology<br><div style="display: flex; justify-content: space-between;"> <div><input type="checkbox"/> Riffle %</div> <div><input type="checkbox"/> Run %</div> </div> <div style="display: flex; justify-content: space-between;"> <div><input type="checkbox"/> Pool %</div> <div><input type="checkbox"/> Glide Pool</div> </div> <div><input type="checkbox"/> Step Pool Series</div> |
|  | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |   |
|  |  |   |   |
|  |  |   |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0      m <sup>2</sup> 0      ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000      ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |   |
|  |  |   |   |

|  |                 |   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|-------------------------------------|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><div><input type="checkbox"/> Rooted Emergent    <input type="checkbox"/> Rooted Submergent    <input type="checkbox"/> Rooted Floating    <input checked="" type="checkbox"/> None<br/><input type="checkbox"/> Free Floating    <input type="checkbox"/> Attached Algae    <input type="checkbox"/> Floating Algae</div> <div>Portion of the reach with aquatic vegetation present <div>0</div>%</div>  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>WATER QUALITY</b>                           |                 | Temperature    ### °C    n/a    57.3    Water Odors<br>Conductivity    µs/cm <div>164.9</div> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <div>117</div> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <div>7.5</div><br>Turbidity <div></div> Water Surface Oils<br><div><input type="checkbox"/> Clear    <input checked="" type="checkbox"/> Slight Turbid    <input type="checkbox"/> Turbid    <input type="checkbox"/> Slick    <input type="checkbox"/> Sheen    <input type="checkbox"/> Globbs    <input type="checkbox"/> Flecks<br/><input type="checkbox"/> Opaque    <input type="checkbox"/> Stained    <input type="checkbox"/> Other    <input type="checkbox"/> Other</div>   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <div><b>Odors</b><br/><input checked="" type="checkbox"/> Normal    <input type="checkbox"/> Sewage    <input type="checkbox"/> Petroleum<br/><input type="checkbox"/> Chemical    <input type="checkbox"/> Anaerobic    <input type="checkbox"/> None<br/><input type="checkbox"/> Other</div> <div><b>Deposits</b><br/><input type="checkbox"/> Sludge    <input type="checkbox"/> Sawdust    <input type="checkbox"/> Paper fiber    <input type="checkbox"/> Sand<br/><input type="checkbox"/> Relic Shells    <input type="checkbox"/> Other</div> <div><b>Oils</b><br/><input checked="" type="checkbox"/> Absent    <input type="checkbox"/> Slight    <input type="checkbox"/> Moderate    <input type="checkbox"/> Profuse    <input type="checkbox"/> Yes    <input type="checkbox"/> No</div> <div>Looking at stones which are not deeply embedded, are undersides black in color?</div> |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          | <b>Substrate Type</b>   | <b>Characteristic</b>               |                          |                          |  | <b>% Composition in Sampling Reach</b> |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Bedrock  |                 |   |                          |                          |                          | Detritus  | Sticks, wood, coarse plant material |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          | Muck- Mud   | Black very fine organic matter      |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Gravel   | 0.1 - 2.5"      | 15  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Sand   | gritty          | 20  |                          |                          |                          | Marl  | Grey, shell fragments               |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Silt   | gooeey          | 60  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                                     |                          |                          |  |  |                          |                          |  |                          |                          |                          |                          |                          |                          |                          |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                                     |                          |                          | <b>Marginal</b>  |  |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                          |                          |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                                     |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |  |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                          |                          |                          |   |
| <b>Score</b>                                   | <b>6</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>               | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                                  | 14                       | 13                       | 12   | 11                                     | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                        | 2                        | 1                        | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>4</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                                     |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                                   | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |

|   |          |   |                          |                          |                                     |                                     |  |                          |                                     |                          |                                     |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                                     |                          |                                     | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                                  | 16                                  | 15   | 14                       | 13                                  | 12                       | 11                                  | 10   | 9                        | 8                        | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                                     |                          |                                     | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>3</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>3</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                                     | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                                     |                          |                                     | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>1</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                                   | 3                        | 2                                   | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>86</b>   |                          |                          |                                     |                                     |  |                          |                                     |                          |                                     |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #20                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23766                            | <b>Long:</b> -87.35182 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will Wright               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:17 PM           | 404 Functional Assessment |

|  |  |   |  |  |   |
|--|--|---|--|--|---|
| <b>WEATHER CONDITIONS</b>  | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |  |   |
| <b>SITE LOCATION/MAP</b>   | <b>See Attachment</b>  |   |  |  |   |
| <b>STREAM CHARACTERIZATION</b>   | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.01<br><b>Km<sup>2</sup></b> 0.0   |   |  |  |   |
| <b>WATERSHED FEATURES</b>  | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest ##### <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential<br><br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>   | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast forest  |   |  |  |   |
| <b>INSTREAM FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> Est. Reach Length      ft      79      m      24<br/> Est. Stream Width      ft           m      0.0<br/> Sampling Reach Area    ft<sup>2</sup>    0    m<sup>2</sup>    0<br/> Sampling Area mile<sup>2</sup>    mile<sup>2</sup>    0.0    km<sup>2</sup>    0.0<br/> Area in km<sup>2</sup>            mile<sup>2</sup>    0.0    km<sup>2</sup>    0.0<br/> Est. Water Depth        in      0.0    m      0.0<br/> Surface Velocity        ft/s    0.0    m/s    0.0 </td> <td style="width: 50%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br/><br/> High Water Mark      ft      0.00<br/> High Water Mark      m      0.00<br/> % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series </td> </tr> </table><br>Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  | Est. Reach Length      ft      79      m      24<br>Est. Stream Width      ft           m      0.0<br>Sampling Reach Area    ft <sup>2</sup> 0    m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0    km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0    km <sup>2</sup> 0.0<br>Est. Water Depth        in      0.0    m      0.0<br>Surface Velocity        ft/s    0.0    m/s    0.0 | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark      ft      0.00<br>High Water Mark      m      0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |
| Est. Reach Length      ft      79      m      24<br>Est. Stream Width      ft           m      0.0<br>Sampling Reach Area    ft <sup>2</sup> 0    m <sup>2</sup> 0<br>Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0    km <sup>2</sup> 0.0<br>Area in km <sup>2</sup> mile <sup>2</sup> 0.0    km <sup>2</sup> 0.0<br>Est. Water Depth        in      0.0    m      0.0<br>Surface Velocity        ft/s    0.0    m/s    0.0 | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded<br><br>High Water Mark      ft      0.00<br>High Water Mark      m      0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series  |   |  |  |   |
| <b>LARGE WOODY DEBRIS</b>  | <b>LWD</b> 0.0    m <sup>2</sup> 0    ft <sup>2</sup><br><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000    ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |  |   |

|                                       |                 |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|--|--|--|-------------------------------------|-------------------------------------|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">15%</span>  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 40px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |  |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  |  |  |  | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  |  |  |  | Detritus                            | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  |  |  |  | Muck-Mud                            | Black very fine organic matter      |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 5   |  |  |  |  |  | Marl                                | Grey, shell fragments               |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 80  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 15  |  |  |  |  |  |                                     |                                     |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                                     |                          |   |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |

|   |          |   |                          |                                     |                          |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|----------|---|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                          |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                                  | 17                       | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                          |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                          |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                          |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>97</b>   |                          |                                     |                          |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #21                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23785                            | <b>Long:</b> -87.35165 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:21 PM           | 404 Functional Assessment |

|   |  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
|---|--|---|--|---|--|--------------------------|-----------------------|---------------------------------|---|-------------------|---------------------|-----------------|---|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------------------|-------------------------|-------------------|-----------------|-----------------|-------------------------|-------------------|-----|-----------------|-----|------------------|------------------|------|-----|-----|------------------|--|-----|-----|------|--|--|--|--|--|--|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><table style="width: 100%;"> <tr> <td><b>Air Temp °C</b></td> <td style="text-align: center;"><b>18</b></td> </tr> <tr> <td><b>Air Temp °F</b></td> <td style="text-align: center;"><b>65</b></td> </tr> </table> <b>Other:</b> | <b>Air Temp °C</b>  | <b>18</b>  | <b>Air Temp °F</b>       | <b>65</b>             |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>Air Temp °C</b>  | <b>18</b>  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>Air Temp °F</b>  | <b>65</b>  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>STREAM CHARACTERIZATION</b>  | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Stream Subsystem</b><br/> <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br/><br/> <b>Stream Origin</b><br/> <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br/> <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other           </td> <td style="width: 50%;"> <b>Stream Type</b><br/> <input type="checkbox"/> Coldwater<br/> <input checked="" type="checkbox"/> Warmwater<br/><br/> <b>Catchment Area</b><br/> <table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> </td> </tr> </table>   |   |  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> | <b>Mile<sup>2</sup></b>  | <b>0.01</b>           | <b>Km<sup>2</sup></b>           | <b>0.0</b>                                      |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
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| <b>Mile<sup>2</sup></b>   | <b>0.01</b>  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>Km<sup>2</sup></b>   | <b>0.0</b>   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>WATERSHED FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Surrounding Land use &amp; Percentage</b><br/> <input checked="" type="checkbox"/> Forest <b>####</b> <input type="checkbox"/> Commercial<br/> <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br/> <input type="checkbox"/> Agriculture _____<br/> <input type="checkbox"/> Residential           </td> <td style="width: 50%;"> <b>Local Watershed NPS Pollution</b><br/> <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br/> <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br/> <b>Local Watershed Erosion</b><br/> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy           </td> </tr> </table>  |   |  | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>####</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy         |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
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| <b>RIPARIAN VEGETATION (18 meter buffer)</b>  | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>INSTREAM FEATURES</b>  | <table style="width: 100%;"> <tr> <td style="width: 60%;"> <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>40</td> <td>m</td> <td>12</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> </tr> </table> </td> <td style="width: 40%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br/><br/>           High Water Mark ft 0.00<br/>           High Water Mark m 0.00<br/><br/>           % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series           </td> </tr> <tr> <td colspan="5">           Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br/>           Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         </td> </tr> </table> |   |  | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>40</td> <td>m</td> <td>12</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> </tr> </table> | Est. Reach Length  | ft                       | 40                    | m                               | 12  | Est. Stream Width | ft                  |                 | m | 0.0            | Sampling Reach Area | ft <sup>2</sup>                 | 0                 | m <sup>2</sup> | 0               | Sampling Area mile <sup>2</sup> | mile <sup>2</sup>       | 0.0               | km <sup>2</sup> | 0.0             | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in               |      | m   | 0.0 | Surface Velocity | ft/s   | n/a | m/s | #### | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br><br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  |  |
| <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>40</td> <td>m</td> <td>12</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> </tr> </table> | Est. Reach Length  | ft  | 40   | m   | 12   | Est. Stream Width        | ft                    |                                 | m   | 0.0               | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0                   | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0            | km <sup>2</sup> | 0.0                             | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0             | km <sup>2</sup> | 0.0                     | Est. Water Depth  | in  |                 | m   | 0.0              | Surface Velocity | ft/s | n/a | m/s | ####             | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br><br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series |     |     |      |  |  |  |  |  |  |
| Est. Reach Length   | ft   | 40  | m  | 12  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Est. Stream Width   | ft   |   | m  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Sampling Reach Area   | ft <sup>2</sup>  | 0   | m <sup>2</sup>   | 0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Sampling Area mile <sup>2</sup>   | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Area in km <sup>2</sup>   | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Est. Water Depth  | in   |   | m  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Surface Velocity  | ft/s   | n/a   | m/s  | ####  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>LARGE WOODY DEBRIS</b>   | <table style="width: 100%;"> <tr> <td><b>LWD</b></td> <td><u>0.0</u> m<sup>2</sup></td> <td><u>0</u> ft<sup>2</sup></td> </tr> <tr> <td><b>Density of LWD</b></td> <td>m<sup>2</sup>/km<sup>2</sup></td> <td>0.0000000000 ft<sup>2</sup>/mile<sup>2</sup></td> </tr> </table>  |   |  | <b>LWD</b>  | <u>0.0</u> m <sup>2</sup>  | <u>0</u> ft <sup>2</sup> | <b>Density of LWD</b> | m <sup>2</sup> /km <sup>2</sup> | 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>LWD</b>  | <u>0.0</u> m <sup>2</sup>  | <u>0</u> ft <sup>2</sup>  |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |
| <b>Density of LWD</b>   | m <sup>2</sup> /km <sup>2</sup>  | 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup>   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |      |  |  |  |  |  |  |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">35%</span>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 |   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          |   |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooey           | 95  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|-------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                                  | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>97</b>   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #22                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23794                            | <b>Long:</b> -87.35129 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will Wright               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:45 PM           | 404 Functional Assessment |

|  |   |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|--|---|---|--|-------------------|--|----|---|----|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|-----------------|------------------|----|--|---|-----|-----------------|------------------|------|-----|-----|------|------------------------|-------------|---|--|--|--|--|-------------|---|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br>Mile <sup>2</sup> 0.01<br>Km <sup>2</sup> 0.0  |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast forest   |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>67</td> <td>m</td> <td>20</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td rowspan="2"> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC </td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="5"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length | ft   | 67 | m | 20 | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark | Est. Water Depth | in |  | m | 0.0 | High Water Mark | Surface Velocity | ft/s | n/a | m/s | #### | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft  | 67  | m  | 20                | <b>Canopy Cover</b>  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width                            | ft  |   | m  | 0.0               |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0                 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               | High Water Mark  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth                             | in  |   | m  | 0.0               | High Water Mark  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity                             | ft/s  | n/a   | m/s  | ####              | % of Stream Morphology   |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %   |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|  |   |   |  |                   | <input type="checkbox"/> Step Pool Series  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |                   |  |    |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |

|  |                 |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Bedrock  |                 |   |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      |   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Sand   | gritty          | 5   |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Silt   | gooey           | 90  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Score</b>                                   | <b>2</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|-------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                                  | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>98</b>   |                          |                                     |                          |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #23                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23798                            | <b>Long:</b> -87.35101 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate Noland               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:26 PM           | 404 Functional Assessment |

|  |  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|--|--|---|--|-------------------|--|-----|---|----|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|-----------------|------------------|----|-----|---|-----|-----------------|------------------|------|-----|-----|-----|------------------------|-------------|---|--|--|--|--|-------------|---|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br>Mile <sup>2</sup> 0.1<br>Km <sup>2</sup> 0.3  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>139</td> <td>m</td> <td>42</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td rowspan="2"> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC </td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>0.5</td> <td>m</td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.2</td> <td>m/s</td> <td>0.1</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="5"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length | ft   | 139 | m | 42 | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark | Est. Water Depth | in | 0.5 | m | 0.0 | High Water Mark | Surface Velocity | ft/s | 0.2 | m/s | 0.1 | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft   | 139   | m  | 42                | <b>Canopy Cover</b>  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width                            | ft   |   | m  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>  | 0   | m <sup>2</sup>   | 0                 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth                             | in   | 0.5   | m  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity                             | ft/s   | 0.2   | m/s  | 0.1               | % of Stream Morphology   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |   |  |                   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |   |  |                   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|  |  |   |  |                   | <input type="checkbox"/> Step Pool Series  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |     |   |     |                 |                  |      |     |     |     |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">10 %</span>   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature    13.1 °C    55.5 °F    Water Odors<br>Conductivity    μs/cm    97.4 <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    69.2 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    7.5<br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Bedrock  |                 |   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 5   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Sand   | gritty          | 25  |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Silt   | gooey           | 65  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                                     |                          |                          |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |                          |                          |   |   |
| <b>Score</b>                                   | <b>3</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                                   | 4                        | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                                   | 2                        | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                                   | 2                        | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                                   | 2                        | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                                   | 2                        | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                                     |                          |                          |   |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                                   | 2                        | 1                        | 0 |

|   |           |   |                          |                                     |                          |                                     |  |                          |                          |                                     |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|-----------|---|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |           | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                          |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                                     |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19                       | 18                                  | 17                       | 16                                  | 15   | 14                       | 13                       | 12                                  | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |           | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                          |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                                     |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |           | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                          |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                                     |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |           | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                          |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                                     |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Left Bank   | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | Right Bank  | 10                       | 9                                   | 8                        | 7                                   | 6  | 5                        | 4                        | 3                                   | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  | <b>88</b> |   |                          |                                     |                          |                                     |  |                          |                          |                                     |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #24                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23823                            | <b>Long:</b> -87.35066 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Nate                      |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:48 PM           | 404 Functional Assessment |

|  |   |                       |   |  |  |  |  |
|--|---|-----------------------|---|--|--|--|--|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b>  |                       | <b>Past 24-Hours</b>  |  | <b>Heavy rain in last 7-days</b>   |  |  |
|  | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   |                       | <input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny |  | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b>   |  |  |
|  |   |                       |   |  |  |  |  |
|  |   |                       |   |  |  |  |  |
| <b>SITE LOCATION/MAP</b>                     |   | <b>See Attachment</b> |   |  |  |  |  |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b>   |                       |   |  | <b>Stream Type</b>   |  |  |
|  | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other |                       |   |  | <input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.01<br><b>Km<sup>2</sup></b> 0.0  |  |  |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b>  |                       |   |  | <b>Local Watershed NPS Pollution</b>   |  |  |
|  | <input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential  |                       |   |  | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |  |  |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b>   |                       |   |  |  |  |  |
|  | <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest   |                       |   |  |  |  |  |
| <b>INSTREAM FEATURES</b>                     | Est. Reach Length ft 104 m 32   |                       |   |  | <b>Canopy Cover</b>  |  |  |
|  | Est. Stream Width ft m 0.0  |                       |   |  | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded  |  |  |
|  | Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0  |                       |   |  |  |  |  |
|  | Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |                       |   |  |  |  |  |
|  | Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |                       |   |  | High Water Mark ft 0.00  |  |  |
|  | Est. Water Depth in m 0.0   |                       |   |  | High Water Mark m 0.00   |  |  |
|  | Surface Velocity ft/s n/a m/s #####   |                       |   |  | % of Stream Morphology   |  |  |
|  | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |                       |   |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series   |  |  |
|  | Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |                       |   |  |  |  |  |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup>   |                       |   |  |  |  |  |
|  | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |                       |   |  |  |  |  |

|                                       |                 |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|-----------------------|-------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature    ### °C    n/a °F    Water Odors<br>Conductivity    μs/cm <input type="text"/> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <input type="text"/> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <input type="text"/><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other                                    |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |                       |                                     |  |  | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |  |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  | <b>Substrate Type</b> | <b>Characteristic</b>               |  |  | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  | Detritus              | Sticks, wood, coarse plant material |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  | Muck-Mud              | Black very fine organic matter      |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          |   |  |  | Marl                  | Grey, shell fragments               |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 90  |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 10  |  |  |                       |                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                                     |                          |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                                     |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                                     |                          |   |
| <b>Score</b>                                   | <b>1</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                                   | 1                        | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                          |                                     |                                     |  |                          |                          |                          |                          |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
|---|----------|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                                     |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                                     | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                       | 17                                  | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                        | 7                        | 6                                   | 5   | 4                        | 3                        | 2                        | 1                        |                          |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                                     |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                                     | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                                     |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                                     | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                                     |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                                     | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> |   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   |                          |                          |                          |                          | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                                     | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                        | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>95</b>   |                          |                          |                                     |                                     |  |                          |                          |                          |                          |  |                          |                          |                          |                                     |   |                          |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #25                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23831                            | <b>Long:</b> -87.35022 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Will Wright               |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 3:12 PM           | 404 Functional Assessment |

|   |   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
|---|---|---|--|---|--|--------------------------|-----------------------|---------------------------------|---|-------------------|---------------------|-----------------|---|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------------------|-------------------------|-------------------|-----------------|-----------------|-------------------------|-------------------|-----|-----------------|-----|------------------|------------------|------|-----|-----|------------------|---|-----------------|-----|------|---|-----------------|------|------|-----------------|---|------|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><table style="width: 100%;"> <tr> <td><b>Air Temp °C</b></td> <td style="text-align: center;"><b>18</b></td> </tr> <tr> <td><b>Air Temp °F</b></td> <td style="text-align: center;"><b>65</b></td> </tr> </table> <b>Other:</b> | <b>Air Temp °C</b>  | <b>18</b>  | <b>Air Temp °F</b>       | <b>65</b>             |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Air Temp °C</b>  | <b>18</b>   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Air Temp °F</b>  | <b>65</b>   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>STREAM CHARACTERIZATION</b>  | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Stream Subsystem</b><br/> <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br/><br/> <b>Stream Origin</b><br/> <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br/> <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other           </td> <td style="width: 50%;"> <b>Stream Type</b><br/> <input type="checkbox"/> Coldwater<br/> <input checked="" type="checkbox"/> Warmwater<br/><br/> <b>Catchment Area</b><br/> <table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> </td> </tr> </table>  |   |  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> | <b>Mile<sup>2</sup></b>  | <b>0.01</b>           | <b>Km<sup>2</sup></b>           | <b>0.0</b>                                      |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other  | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table>  | <b>Mile<sup>2</sup></b>   | <b>0.01</b>  | <b>Km<sup>2</sup></b>   | <b>0.0</b>   |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Mile<sup>2</sup></b>   | <b>0.01</b>   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Km<sup>2</sup></b>   | <b>0.0</b>  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>WATERSHED FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Surrounding Land use &amp; Percentage</b><br/> <input checked="" type="checkbox"/> Forest <b>100%</b> <input type="checkbox"/> Commercial<br/> <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br/> <input type="checkbox"/> Agriculture _____<br/> <input type="checkbox"/> Residential           </td> <td style="width: 50%;"> <b>Local Watershed NPS Pollution</b><br/> <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br/> <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br/> <b>Local Watershed Erosion</b><br/> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy           </td> </tr> </table>   |   |  | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>100%</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy         |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>100%</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>  | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Soft mast forest   |   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>INSTREAM FEATURES</b>  | <table style="width: 100%;"> <tr> <td style="width: 60%;"> <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>69</td> <td>m</td> <td>21</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>0.0</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.0</td> <td>m/s</td> <td>0.0</td> </tr> </table> </td> <td style="width: 40%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br/><br/> <table style="width: 100%;"> <tr> <td>High Water Mark</td> <td>ft</td> <td>0.00</td> </tr> <tr> <td>High Water Mark</td> <td>m</td> <td>0.00</td> </tr> </table> <b>% of Stream Morphology</b><br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series           </td> </tr> </table> |   |  | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>69</td> <td>m</td> <td>21</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>0.0</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.0</td> <td>m/s</td> <td>0.0</td> </tr> </table> | Est. Reach Length  | ft                       | 69                    | m                               | 21  | Est. Stream Width | ft                  |                 | m | 0.0            | Sampling Reach Area | ft <sup>2</sup>                 | 0                 | m <sup>2</sup> | 0               | Sampling Area mile <sup>2</sup> | mile <sup>2</sup>       | 0.0               | km <sup>2</sup> | 0.0             | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in               | 0.0  | m   | 0.0 | Surface Velocity | ft/s  | 0.0             | m/s | 0.0  | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC<br><br><table style="width: 100%;"> <tr> <td>High Water Mark</td> <td>ft</td> <td>0.00</td> </tr> <tr> <td>High Water Mark</td> <td>m</td> <td>0.00</td> </tr> </table> <b>% of Stream Morphology</b><br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | High Water Mark | ft   | 0.00 | High Water Mark | m | 0.00 |
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| Est. Reach Length   | ft  | 69  | m  | 21  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Est. Stream Width   | ft  |   | m  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Sampling Reach Area   | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Sampling Area mile <sup>2</sup>   | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Area in km <sup>2</sup>   | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Est. Water Depth  | in  | 0.0   | m  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| Surface Velocity  | ft/s  | 0.0   | m/s  | 0.0   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| High Water Mark   | ft  | 0.00  |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| High Water Mark   | m   | 0.00  |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>LARGE WOODY DEBRIS</b>   | <table style="width: 100%;"> <tr> <td><b>LWD</b></td> <td><u>0.0</u> m<sup>2</sup></td> <td><u>0</u> ft<sup>2</sup></td> </tr> <tr> <td><b>Density of LWD</b></td> <td>m<sup>2</sup>/km<sup>2</sup></td> <td>0.0000000000 ft<sup>2</sup>/mile<sup>2</sup></td> </tr> </table>   |   |  | <b>LWD</b>  | <u>0.0</u> m <sup>2</sup>  | <u>0</u> ft <sup>2</sup> | <b>Density of LWD</b> | m <sup>2</sup> /km <sup>2</sup> | 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>LWD</b>  | <u>0.0</u> m <sup>2</sup>   | <u>0</u> ft <sup>2</sup>  |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |
| <b>Density of LWD</b>   | m <sup>2</sup> /km <sup>2</sup>   | 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup>   |  |   |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |   |                 |     |      |   |                 |      |      |                 |   |      |

|                                       |                 |   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|-----------------------|-------------------------------------|--|-------------------------------------|--|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |                       |                                     |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |  |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  | <b>Substrate Type</b> | <b>Characteristic</b>               |  |                                     | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  | Detritus              | Sticks, wood, coarse plant material |  |                                     |  |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  | Muck-Mud              | Black very fine organic matter      |  |                                     |  |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      | 5   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 10  |  |  | Marl                  | Grey, shell fragments               |  |                                     |  |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 80  |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 5   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                                     |                          |                          |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                                   | <b>2</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |

|   |   |   |   |  |
|---|---|---|---|--|
| <b>2. Pool Substrate Characterization</b> | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
|   |   | 20 19 18 17 16  | 15 14 13 12 11  | 10 9 8 7 6 5 4 3 2 1 0   |
| <b>3. Pool Variability</b>                | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |
| <b>Score</b>                              | <b>4</b>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>            |
|   |   | 20 19 18 17 16  | 15 14 13 12 11  | 10 9 8 7 6 5 4 3 2 1 0   |
| <b>4.Sediment Deposition</b>              | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.   |
| <b>Score</b>                              | <b>18</b>   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>            |
|   |   | 20 19 18 17 16  | 15 14 13 12 11  | 10 9 8 7 6 5 4 3 2 1 0   |
| <b>5. Channel Flow Status</b>             | Water reaches base of both lower banks, and mimimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>            |
|   |   | 20 19 18 17 16  | 15 14 13 12 11  | 10 9 8 7 6 5 4 3 2 1 0   |
| <b>6. Channel Alteration</b>              | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.  |
| <b>Score</b>                              | <b>18</b>   | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>  | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>            |
|   |   | 20 19 18 17 16  | 15 14 13 12 11  | 10 9 8 7 6 5 4 3 2 1 0   |

|   |          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                          |   |                          |                          |                          |   |
|---|----------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|---|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                          |                          |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                          |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |   |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | 20  | 19                       | 18                       | 17                       | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                        | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1 |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                          |                          |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                          |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>3</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>3</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                          |                          |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                          |                          |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                          |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |   |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Left Bank   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |          | Right Bank  | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                          |                          |                          |   |                          |                          |                          |   |
| <b>TOTAL SCORE</b>  |          | <b>93</b>   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                          |                          |   |                          |                          |                          |   |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #26(60)                       |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23791                            | <b>Long:</b> -87.34995 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Josh Iddings              |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:54 PM           | 404 Functional Assessment |

|   |   |  |   |   |  |                              |
|---|---|--|---|---|--|------------------------------|
| <b>WEATHER CONDITIONS</b>   | <b>Current</b>  |  | <b>Past 24-Hours</b>  |   | <b>Heavy rain in last 7-days</b>                                       |                              |
|   | Storm (Heavy Rain)  |  | <input type="checkbox"/> Storm (Heavy Rain)                     |   | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes    |                              |
|   | <input type="checkbox"/> Rain Steady  |  | <input type="checkbox"/> Rain Steady                            |   | <b>Air Temp °C</b> 18  |                              |
|   | <input type="checkbox"/> Showers (Intermittent)   |  | <input type="checkbox"/> Showers (Intermittent)                 |   | <b>Air Temp °F</b> 65  |                              |
|   | <input type="checkbox"/> Cloud Cover %  |  | <input checked="" type="checkbox"/> Cloud Cover %               |   | 90 <b>Other:</b>   |                              |
|   | <input checked="" type="checkbox"/> Clear/Sunny   |  | <input type="checkbox"/> Clear/Sunny                            |   |  |                              |
| <b>SITE LOCATION/MAP</b>  | <b>See Attachment</b>   |  |   |   |  |                              |
| <b>STREAM CHARACTERIZATION</b>  | <b>Stream Subsystem</b>   |  |   | <b>Stream Type</b>  |  |                              |
|   | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral  |  |   | <input type="checkbox"/> Coldwater  |  |                              |
|   |   |  |   | <input checked="" type="checkbox"/> Warmwater   |  |                              |
|   | <b>Stream Origin</b>  |  |   | <b>Catchment Area</b>   |  |                              |
| <input type="checkbox"/> Upland Runoff  |   |  | <input checked="" type="checkbox"/> Mixture of Origins          |   |  | <b>Mile<sup>2</sup></b> 0.01 |
| <input type="checkbox"/> Spring-fed/Ground water                                |   |  | <input type="checkbox"/> Wetland <input type="checkbox"/> Other |   |  | <b>Km<sup>2</sup></b> 0.0    |
| <b>WATERSHED FEATURES</b>   | <b>Surrounding Land use &amp; Percentage</b>  |  |   | <b>Local Watershed NPS Pollution</b>  |  |                              |
|   | <input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial   |  |   | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources                      |  |                              |
|   | <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other   |  |   | <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b>                           |  |                              |
|   | <input type="checkbox"/> Agriculture  |  |   | <b>Local Watershed Erosion</b>  |  |                              |
|   | <input type="checkbox"/> Residential  |  |   | <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |  |                              |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>                                    | <b>Indicate the dominant type and record the dominant species present</b>   |  |   |   |  |                              |
|   | <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None |  |   |   |  |                              |
|   | <b>Dominant Species:</b> Mixed hard and soft mast forest  |  |   |   |  |                              |
| <b>INSTREAM FEATURES</b>  | Est. Reach Length   |  |   |   | <b>Canopy Cover</b>  |                              |
|   | ft m 0  |  |   |   | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open     |                              |
|   | Est. Stream Width   |  |   |   | <input type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded |                              |
|   | ft <sup>2</sup> 0 m <sup>2</sup> 0  |  |   |   |  |                              |
|   | Sampling Reach Area   |  |   |   |  |                              |
|   | Sampling Area mile <sup>2</sup>   |  |   |   |  |                              |
|   | mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |  |   |   |  |                              |
|   | Area in km <sup>2</sup>   |  |   |   |  |                              |
|   | mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |  |   |   |  |                              |
|   | Est. Water Depth  |  |   |   | High Water Mark ft 0.00  |                              |
| in 1.0 m 0.0  |   |  |   | High Water Mark m 0.00  |  |                              |
| Surface Velocity  |   |  |   | % of Stream Morphology  |  |                              |
| ft/s 0.0 m/s 0.0  |   |  |   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %  |  |                              |
| Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  |   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool                                       |  |                              |
| Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |   |  |   | <input type="checkbox"/> Step Pool Series   |  |                              |
| <b>LARGE WOODY DEBRIS</b>   | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup>   |  |   |   |  |                              |
|   | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |  |   |   |  |                              |

|  |                 |  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|--|--------------------------|--------------------------|--------------------------|---|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">5%</span>  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature    14.4 °C    58 °F    Water Odors<br>Conductivity    μs/cm    51.8 <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids    37.8 mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH    5.9<br>Turbidity <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other<br>Water Surface Oils<br><input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Other |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Deposits</b><br>Looking at stones which are not deeply embedded, are undersides black in color?<br><b>Oils</b><br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |  |                          |                          |                          |   |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>   |                          |                          |                          |   |                          | <b>Substrate Type</b>               | <b>Characteristic</b>               | <b>% Composition in Sampling Reach</b>   |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 |  |                          |                          |                          |   |                          | Detritus                            | Sticks, wood, coarse plant material |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            |  |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       |  |                          |                          |                          |   |                          | Muck-Mud                            | Black very fine organic matter      |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 15   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          | 15   |                          |                          |                          |   |                          | Marl                                | Grey, shell fragments               |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooeey          | 60   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           | 10   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>   |                          |                          |                          |   |                          |                                     |                                     |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>   |                          |                          |                          | <b>SubOptimal</b>   |                          |                                     |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                                     |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20   | 19                       | 18                       | 17                       | 16  | 15                       | 14                                  | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            |                          |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                          |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>3</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                                     |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>97</b>   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                |                           |  |
|---|--------------|-------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                         | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #26(61)                       |              |                         | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23844                            | <b>Long:</b> | -87.35014               | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Nate Noland               |              |                         |                                |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 5-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 2:59 PM    |                                | 404 Functional Assessment |  |

|  |   |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|--|---|---|--|-------------------|--|-----|---|-----|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|-----------------|------------------|----|--|---|-----|-----------------|------------------|------|-----|-----|------|------------------------|-------------|---|--|--|--|--|-------------|---|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.02<br><b>Km<sup>2</sup></b> 0.1  |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest  |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>468</td> <td>m</td> <td>143</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td rowspan="2"> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC </td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td></td> <td colspan="3"></td> <td></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length | ft   | 468 | m | 143 | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark | Est. Water Depth | in |  | m | 0.0 | High Water Mark | Surface Velocity | ft/s | n/a | m/s | #### | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft  | 468   | m  | 143               | <b>Canopy Cover</b>  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width                            | ft  |   | m  | 0.0               |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0                 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               | High Water Mark  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth                             | in  |   | m  | 0.0               | High Water Mark  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity                             | ft/s  | n/a   | m/s  | ####              | % of Stream Morphology   |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %   |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|  |   |   |  |                   | <input type="checkbox"/> Step Pool Series  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.1 m <sup>2</sup> 1 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000929 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000359   |   |  |                   |  |     |   |     |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |

|                                       |                 |   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------|---|--|--|-----------------------|-------------------------------------|--|-------------------------------------|--|--|--|--|--|--|--|--|--|
| <b>AQUATIC VEGETATION</b>             |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">20%</span>  |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>WATER QUALITY</b>                  |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>SEDIMENT/ SUBSTRATE</b>            |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| <b>INORGANIC SUBSTRATE COMPONENTS</b> |                 |   |  |  |                       |                                     |  | <b>ORGANIC SUBSTRATE COMPONENTS</b> |  |  |  |  |  |  |  |  |  |
| <b>Substrate Type</b>                 | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |  |  | <b>Substrate Type</b> | <b>Characteristic</b>               |  |                                     | <b>% Composition in Sampling Reach</b> |  |  |  |  |  |  |  |  |
| Bedrock                               |                 |   |  |  | Detritus              | Sticks, wood, coarse plant material |  |                                     |  |  |  |  |  |  |  |  |  |
| Boulder                               | >10"            |   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Cobble                                | 2.5 - 10"       |   |  |  | Muck-Mud              | Black very fine organic matter      |  |                                     |  |  |  |  |  |  |  |  |  |
| Gravel                                | 0.1 - 2.5"      |   |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Sand                                  | gritty          | 5   |  |  | Marl                  | Grey, shell fragments               |  |                                     |  |  |  |  |  |  |  |  |  |
| Silt                                  | gooey           | 85  |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |
| Clay                                  | slick           | 10  |  |  |                       |                                     |  |                                     |  |  |  |  |  |  |  |  |  |

| <b>Habitat Parameter</b>                       | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |                          |   |                          |                          |                          |                          |  |                          |                          |                          |                          |  |                          |                          |                                     |                          |                          |   |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|
|  | <b>Optimal</b>  |                          |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |                          |                          | <b>Marginal</b>  |                          |                          |                          |                          | <b>Poor</b>  |                          |                          |                                     |                          |                          |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient). |                          |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |                          |                          | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                                   | <b>2</b>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|  |   | 20                       | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                       | 12                       | 11   | 10                       | 9                        | 8                        | 7                        | 6  | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |

|   |          |   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>5</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>5</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>90</b>   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #27                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23845                            | <b>Long:</b> -87.34994 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Rajesh Poudel             |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:51 PM           | 404 Functional Assessment |

|  |   |  |   |   |   |                              |
|--|---|--|---|---|---|------------------------------|
| <b>WEATHER CONDITIONS</b>                        | <b>Current</b>  |  | <b>Past 24-Hours</b>  |   | <b>Heavy rain in last 7-days</b>  |                              |
|  | Storm (Heavy Rain)  |  | <input type="checkbox"/> Storm (Heavy Rain)                     |   | <input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes               |                              |
|  | <input type="checkbox"/> Rain Steady  |  | <input type="checkbox"/> Rain Steady                            |   | <b>Air Temp °C</b> 18   |                              |
|  | <input type="checkbox"/> Showers (Intermittent)   |  | <input type="checkbox"/> Showers (Intermittent)                 |   | <b>Air Temp °F</b> 65   |                              |
|  | <input type="checkbox"/> Cloud Cover %  |  | <input checked="" type="checkbox"/> Cloud Cover %               |   | 90 <b>Other:</b>  |                              |
|  | <input checked="" type="checkbox"/> Clear/Sunny   |  | <input type="checkbox"/> Clear/Sunny                            |   |   |                              |
| <b>SITE LOCATION/MAP</b>                         | <b>See Attachment</b>   |  |   |   |   |                              |
| <b>STREAM CHARACTERIZATION</b>                   | <b>Stream Subsystem</b>   |  |   | <b>Stream Type</b>  |   |                              |
|  | <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral  |  |   | <input type="checkbox"/> Coldwater  |   |                              |
|  |   |  |   | <input checked="" type="checkbox"/> Warmwater   |   |                              |
|  | <b>Stream Origin</b>  |  |   | <b>Catchment Area</b>   |   |                              |
| <input type="checkbox"/> Upland Runoff           |   |  | <input checked="" type="checkbox"/> Mixture of Origins          |   |   | <b>Mile<sup>2</sup></b> 0.01 |
| <input type="checkbox"/> Spring-fed/Ground water |   |  | <input type="checkbox"/> Wetland <input type="checkbox"/> Other |   |   | <b>Km<sup>2</sup></b> 0.0    |
| <b>WATERSHED FEATURES</b>                        | <b>Surrounding Land use &amp; Percentage</b>  |  |   | <b>Local Watershed NPS Pollution</b>  |   |                              |
|  | <input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial   |  |   | <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources                      |   |                              |
|  | <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other   |  |   | <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b>                           |   |                              |
|  | <input type="checkbox"/> Agriculture  |  |   | <b>Local Watershed Erosion</b>  |   |                              |
|  | <input type="checkbox"/> Residential  |  |   | <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy |   |                              |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b>     | <b>Indicate the dominant type and record the dominant species present</b>   |  |   |   |   |                              |
|  | <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None |  |   |   |   |                              |
|  | <b>Dominant Species:</b> Mixed hard and soft mast forest  |  |   |   |   |                              |
| <b>INSTREAM FEATURES</b>                         | Est. Reach Length ft 66 m 20  |  |   |   | <b>Canopy Cover</b>   |                              |
|  | Est. Stream Width ft m 0.0  |  |   |   | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open                |                              |
|  | Sampling Reach Area ft <sup>2</sup> 0 m <sup>2</sup> 0  |  |   |   | <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly Shaded |                              |
|  | Sampling Area mile <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |  |   |   |   |                              |
|  | Area in km <sup>2</sup> mile <sup>2</sup> 0.0 km <sup>2</sup> 0.0   |  |   |   | High Water Mark ft 0.00   |                              |
|  | Est. Water Depth in m 0.0   |  |   |   | High Water Mark m 0.00  |                              |
|  | Surface Velocity ft/s n/a m/s #####   |  |   |   | % of Stream Morphology  |                              |
|  |   |  |   |   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %                  |                              |
|  | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |  |   |   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool               |                              |
|  | Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |  |   |   | <input type="checkbox"/> Step Pool Series   |                              |
| <b>LARGE WOODY DEBRIS</b>                        | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup>   |  |   |   |   |                              |
|  | <b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |  |   |   |   |                              |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">15%</span>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 |   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          | 5   |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooey           | 90  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |

|   |          |   |                          |                                     |                                     |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                                     | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                                  | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                                     | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                                     | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                                   | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>90</b>   |                          |                                     |                                     |                                     |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |                        |                                |                           |
|---|------------------------|--------------------------------|---------------------------|
| <b>Project ID:</b> Somerville South Amendment 2 |                        | <b>Stream Class:</b> Ephemeral |                           |
| <b>Stream ID:</b> #28                           |                        | <b>Location:</b> Mackey, IN    |                           |
| <b>Lat:</b> 38.23719                            | <b>Long:</b> -87.35017 | <b>River Basin:</b>            | Ohio                      |
| <b>Investigators:</b> Rajesh Poudel             |                        |                                |                           |
| <b>Signature:</b>                               |                        | <b>Date:</b> 5-May-2011        | <b>Reason for Survey:</b> |
|   |                        | <b>Time:</b> 2:31 PM           | 404 Functional Assessment |

|  |  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|--|--|---|--|-------------------|--|-----|---|----|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|-----------------|------------------|----|--|---|-----|-----------------|------------------|------|-----|-----|------|------------------------|-------------|---|--|--|--|--|-------------|---|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br><b>Mile<sup>2</sup></b> 0.01<br><b>Km<sup>2</sup></b> 0.0   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 100% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input type="checkbox"/> Agriculture _____<br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>192</td> <td>m</td> <td>59</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td rowspan="2"> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC </td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="5"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length | ft   | 192 | m | 59 | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark | Est. Water Depth | in |  | m | 0.0 | High Water Mark | Surface Velocity | ft/s | n/a | m/s | #### | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft   | 192   | m  | 59                | <b>Canopy Cover</b>  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width                            | ft   |   | m  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>  | 0   | m <sup>2</sup>   | 0                 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input checked="" type="checkbox"/> Shaded <input type="checkbox"/> Partly ShadedC |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth                             | in   |   | m  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity                             | ft/s   | n/a   | m/s  | ####              | % of Stream Morphology   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |   |  |                   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  |   |  |                   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|  |  |   |  |                   | <input type="checkbox"/> Step Pool Series  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 40px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 |   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          | 15  |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooey           | 70  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           | 15  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
|---|-----------|---|---|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
| <b>Score</b>                              | <b>6</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |                          |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |                          |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
| <b>Score</b>                              | <b>17</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |                          |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |                          |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                          |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                        | 8                                   | 7                        | 6                        | 5                        | 4                        | 3                        | 2                                   | 1                        | 0                        |                          |

|   |          |   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>94</b>   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                |                           |  |
|---|--------------|-------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                         | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #29                           |              |                         | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23688                            | <b>Long:</b> | -87.3503                | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Rajesh Poudel             |              |                         |                                |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 5-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 2:34 PM    |                                | 404 Functional Assessment |  |

|  |   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|--|---|---|--|-------------------|--|-----|---|----|---------------------|-------------------|----|--|---|-----|---------------------|-----------------|---|----------------|---|--|---------------------------------|-------------------|-----|-----------------|-----|-------------------------|-------------------|-----|-----------------|-----|-----------------|------------------|----|--|---|-----|-----------------|------------------|------|-----|-----|------|------------------------|-------------|---|--|--|--|--|-------------|---|--|--|--|---|--|--|--|--|--|---|
| <b>WEATHER CONDITIONS</b>                    | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny  | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><b>Air Temp °C</b> 18<br><b>Air Temp °F</b> 65<br><b>Other:</b> |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>SITE LOCATION/MAP</b>                     | <b>See Attachment</b>   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>STREAM CHARACTERIZATION</b>               | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other<br><b>Stream Type</b><br><input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater<br><b>Catchment Area</b><br>Mile <sup>2</sup> 0.01<br>Km <sup>2</sup> 0.0  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>WATERSHED FEATURES</b>                    | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest 90% <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture 10% _____<br><input type="checkbox"/> Residential<br><b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>RIPARIAN VEGETATION (18 meter buffer)</b> | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest  |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>INSTREAM FEATURES</b>                     | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>193</td> <td>m</td> <td>59</td> <td rowspan="2"><b>Canopy Cover</b></td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> <td rowspan="2"><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td></td> <td>m</td> <td>0.0</td> <td>High Water Mark</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>n/a</td> <td>m/s</td> <td>####</td> <td>% of Stream Morphology</td> </tr> <tr> <td>Channelized</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %</td> </tr> <tr> <td>Dam Present</td> <td><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td colspan="3"></td> <td><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool</td> </tr> <tr> <td colspan="5"></td> <td><input type="checkbox"/> Step Pool Series</td> </tr> </table> |   |  | Est. Reach Length | ft   | 193 | m | 59 | <b>Canopy Cover</b> | Est. Stream Width | ft |  | m | 0.0 | Sampling Reach Area | ft <sup>2</sup> | 0 | m <sup>2</sup> | 0 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC | Sampling Area mile <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | High Water Mark | Est. Water Depth | in |  | m | 0.0 | High Water Mark | Surface Velocity | ft/s | n/a | m/s | #### | % of Stream Morphology | Channelized | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run % | Dam Present | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool |  |  |  |  |  | <input type="checkbox"/> Step Pool Series |
| Est. Reach Length                            | ft  | 193   | m  | 59                | <b>Canopy Cover</b>  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Stream Width                            | ft  |   | m  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Reach Area                          | ft <sup>2</sup>   | 0   | m <sup>2</sup>   | 0                 | <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Sampling Area mile <sup>2</sup>              | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Area in km <sup>2</sup>                      | mile <sup>2</sup>   | 0.0   | km <sup>2</sup>  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Est. Water Depth                             | in  |   | m  | 0.0               | High Water Mark  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Surface Velocity                             | ft/s  | n/a   | m/s  | ####              | % of Stream Morphology   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Channelized                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %   |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| Dam Present                                  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |   |  |                   | <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
|  |   |   |  |                   | <input type="checkbox"/> Step Pool Series  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |
| <b>LARGE WOODY DEBRIS</b>                    | <b>LWD</b> 0.0 m <sup>2</sup> 0 ft <sup>2</sup><br><b>Density of LWD</b> m <sup>2</sup> /km <sup>2</sup> 0.0000000000 ft <sup>2</sup> /mile <sup>2</sup> 0.0000000000   |   |  |                   |  |     |   |    |                     |                   |    |  |   |     |                     |                 |   |                |   |  |                                 |                   |     |                 |     |                         |                   |     |                 |     |                 |                  |    |  |   |     |                 |                  |      |     |     |      |                        |             |   |  |  |  |  |             |   |  |  |  |   |  |  |  |  |  |   |

|  |                 |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|--|-----------------|---|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input checked="" type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">5%</span>   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> °F    Water Odors<br>Conductivity <b>μs/cm</b> <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <span style="border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <span style="border: 1px solid black; display: inline-block; width: 30px; height: 15px;"></span><br>Turbidity    Water Surface Oils<br><input type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b> <b>Deposits</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Oils</b> Looking at stones which are not deeply embedded, are undersides black in color?<br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |   |                          |                          |                          |   |                          |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b>    |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>  |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   |                          |                          | <b>% Composition in Sampling Reach</b> |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Bedrock  |                 | 2   |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Boulder  | >10"            |   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Cobble   | 2.5 - 10"       |   |                          |                          | Muck-Mud                 | Black very fine organic matter  |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 53  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Sand   | gritty          | 10  |                          |                          | Marl                     | Grey, shell fragments   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Silt   | gooey           | 30  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| Clay   | slick           | 5   |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>  |                          |                          |                          |   |                          |                          |  |  |                          |                          |                          |  |                          |                          |                          |                          |                                     |                          |   |   |
|  |                 | <b>Optimal</b>  |                          |                          |                          | <b>SubOptimal</b>   |                          |                          |  | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                          |                                     |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).   |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |                          |                          |  | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                          |                                     |                          |   |   |
| <b>Score</b>                                   | <b>1</b>        | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20  | 19                       | 18                       | 17                       | 16  | 15                       | 14                       | 13                                     | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1 | 0 |

|   |           |   |   |   |  |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
|---|-----------|---|---|---|--|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>16</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>1</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                                     |                          |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                                     |                          |   |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                                  | 15                       | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                                   | 1                        | 0 |

|   |          |   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |  |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |  |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |  |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |
| <b>TOTAL SCORE</b>  |          | <b>94</b>   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |  |

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

|   |              |                         |                                |                           |  |
|---|--------------|-------------------------|--------------------------------|---------------------------|--|
| <b>Project ID:</b> Somerville South Amendment 2 |              |                         | <b>Stream Class:</b> Ephemeral |                           |  |
| <b>Stream ID:</b> #30                           |              |                         | <b>Location:</b> Mackey, IN    |                           |  |
| <b>Lat:</b> 38.23608                            | <b>Long:</b> | -87.35117               | <b>River Basin:</b>            | Ohio                      |  |
| <b>Investigators:</b> Rajesh Poudel             |              |                         |                                |                           |  |
| <b>Signature:</b>                               |              | <b>Date:</b> 5-May-2011 |                                | <b>Reason for Survey:</b> |  |
|   |              | <b>Time:</b> 2:11 PM    |                                | 404 Functional Assessment |  |

|  |  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
|--|--|---|--|--|--|--------------------------|-----------------------|---------------------------------|---|-------------------|---------------------|-----------------|---|----------------|---------------------|---------------------------------|-------------------|----------------|-----------------|---------------------------------|-------------------------|-------------------|-----------------|-----------------|-------------------------|-------------------|-----|-----------------|-----|------------------|------------------|------|-----|-----|------------------|--|-----|-----|-----|--|--|--|--|--|--|
| <b>WEATHER CONDITIONS</b>  | <b>Current</b><br>Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input type="checkbox"/> Cloud Cover %<br><input checked="" type="checkbox"/> Clear/Sunny   | <b>Past 24-Hours</b><br><input type="checkbox"/> Storm (Heavy Rain)<br><input type="checkbox"/> Rain Steady<br><input type="checkbox"/> Showers (Intermittent)<br><input checked="" type="checkbox"/> Cloud Cover %<br><input type="checkbox"/> Clear/Sunny | <b>Heavy rain in last 7-days</b><br><input type="checkbox"/> NO <input checked="" type="checkbox"/> Yes<br><table style="width: 100%;"> <tr> <td><b>Air Temp °C</b></td> <td style="text-align: center;"><b>18</b></td> </tr> <tr> <td><b>Air Temp °F</b></td> <td style="text-align: center;"><b>65</b></td> </tr> </table> <b>Other:</b> | <b>Air Temp °C</b>   | <b>18</b>  | <b>Air Temp °F</b>       | <b>65</b>             |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>Air Temp °C</b>   | <b>18</b>  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>Air Temp °F</b>   | <b>65</b>  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>SITE LOCATION/MAP</b>   | <b>See Attachment</b>  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>STREAM CHARACTERIZATION</b>   | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Stream Subsystem</b><br/> <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br/><br/> <b>Stream Origin</b><br/> <input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br/> <input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other           </td> <td style="width: 50%;"> <b>Stream Type</b><br/> <input type="checkbox"/> Coldwater<br/> <input checked="" type="checkbox"/> Warmwater<br/><br/> <b>Catchment Area</b><br/> <table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> </td> </tr> </table>   |   |  | <b>Stream Subsystem</b><br><input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral<br><br><b>Stream Origin</b><br><input type="checkbox"/> Upland Runoff <input checked="" type="checkbox"/> Mixture of Origins<br><input type="checkbox"/> Spring-fed/Ground water <input type="checkbox"/> Wetland <input type="checkbox"/> Other   | <b>Stream Type</b><br><input type="checkbox"/> Coldwater<br><input checked="" type="checkbox"/> Warmwater<br><br><b>Catchment Area</b><br><table style="width: 100%;"> <tr> <td><b>Mile<sup>2</sup></b></td> <td style="text-align: center;"><b>0.01</b></td> </tr> <tr> <td><b>Km<sup>2</sup></b></td> <td style="text-align: center;"><b>0.0</b></td> </tr> </table> | <b>Mile<sup>2</sup></b>  | <b>0.01</b>           | <b>Km<sup>2</sup></b>           | <b>0.0</b>                                      |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
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| <b>Mile<sup>2</sup></b>  | <b>0.01</b>  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>Km<sup>2</sup></b>  | <b>0.0</b>   |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>WATERSHED FEATURES</b>  | <table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Surrounding Land use &amp; Percentage</b><br/> <input checked="" type="checkbox"/> Forest <b>40%</b> <input type="checkbox"/> Commercial<br/> <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br/> <input checked="" type="checkbox"/> Agriculture <b>60%</b> _____<br/> <input type="checkbox"/> Residential           </td> <td style="width: 50%;"> <b>Local Watershed NPS Pollution</b><br/> <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br/> <input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br/> <b>Local Watershed Erosion</b><br/> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy           </td> </tr> </table>   |   |  | <b>Surrounding Land use &amp; Percentage</b><br><input checked="" type="checkbox"/> Forest <b>40%</b> <input type="checkbox"/> Commercial<br><input type="checkbox"/> Field/Pasture <input type="checkbox"/> Other<br><input checked="" type="checkbox"/> Agriculture <b>60%</b> _____<br><input type="checkbox"/> Residential   | <b>Local Watershed NPS Pollution</b><br><input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources<br><input checked="" type="checkbox"/> Obvious sources <b>Ag. induced sediment</b><br><b>Local Watershed Erosion</b><br><input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy         |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
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| <b>RIPARIAN VEGETATION (18 meter buffer)</b>   | <b>Indicate the dominant type and record the dominant species present</b><br><input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbs <input type="checkbox"/> None<br><b>Dominant Species:</b> Mixed hard and soft mast forest, ag field   |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>INSTREAM FEATURES</b>   | <table style="width: 100%;"> <tr> <td style="width: 60%;"> <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>222</td> <td>m</td> <td>68</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>1.0</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.1</td> <td>m/s</td> <td>0.0</td> </tr> </table> </td> <td style="width: 40%;"> <b>Canopy Cover</b><br/> <input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br/> <input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC<br/><br/>           High Water Mark ft 0.00<br/>           High Water Mark m 0.00<br/>           % of Stream Morphology<br/> <input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br/> <input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br/> <input type="checkbox"/> Step Pool Series           </td> </tr> <tr> <td colspan="5">           Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br/>           Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         </td> </tr> </table> |   |  | <table style="width: 100%;"> <tr> <td>Est. Reach Length</td> <td>ft</td> <td>222</td> <td>m</td> <td>68</td> </tr> <tr> <td>Est. Stream Width</td> <td>ft</td> <td></td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Sampling Reach Area</td> <td>ft<sup>2</sup></td> <td>0</td> <td>m<sup>2</sup></td> <td>0</td> </tr> <tr> <td>Sampling Area mile<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Area in km<sup>2</sup></td> <td>mile<sup>2</sup></td> <td>0.0</td> <td>km<sup>2</sup></td> <td>0.0</td> </tr> <tr> <td>Est. Water Depth</td> <td>in</td> <td>1.0</td> <td>m</td> <td>0.0</td> </tr> <tr> <td>Surface Velocity</td> <td>ft/s</td> <td>0.1</td> <td>m/s</td> <td>0.0</td> </tr> </table> | Est. Reach Length  | ft                       | 222                   | m                               | 68  | Est. Stream Width | ft                  |                 | m | 0.0            | Sampling Reach Area | ft <sup>2</sup>                 | 0                 | m <sup>2</sup> | 0               | Sampling Area mile <sup>2</sup> | mile <sup>2</sup>       | 0.0               | km <sup>2</sup> | 0.0             | Area in km <sup>2</sup> | mile <sup>2</sup> | 0.0 | km <sup>2</sup> | 0.0 | Est. Water Depth | in               | 1.0  | m   | 0.0 | Surface Velocity | ft/s   | 0.1 | m/s | 0.0 | <b>Canopy Cover</b><br><input type="checkbox"/> Open <input type="checkbox"/> Partly Open<br><input type="checkbox"/> Shaded <input checked="" type="checkbox"/> Partly ShadedC<br><br>High Water Mark ft 0.00<br>High Water Mark m 0.00<br>% of Stream Morphology<br><input type="checkbox"/> Riffle % <input type="checkbox"/> Run %<br><input type="checkbox"/> Pool % <input type="checkbox"/> Glide Pool<br><input type="checkbox"/> Step Pool Series | Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |  |  |  |  |
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| Est. Stream Width  | ft   |   | m  | 0.0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Sampling Reach Area  | ft <sup>2</sup>  | 0   | m <sup>2</sup>   | 0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Sampling Area mile <sup>2</sup>  | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Area in km <sup>2</sup>  | mile <sup>2</sup>  | 0.0   | km <sup>2</sup>  | 0.0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Est. Water Depth   | in   | 1.0   | m  | 0.0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Surface Velocity   | ft/s   | 0.1   | m/s  | 0.0  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   |  |   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>LARGE WOODY DEBRIS</b>  | <table style="width: 100%;"> <tr> <td><b>LWD</b></td> <td><u>0.3</u> m<sup>2</sup></td> <td><u>3</u> ft<sup>2</sup></td> </tr> <tr> <td><b>Density of LWD</b></td> <td>m<sup>2</sup>/km<sup>2</sup></td> <td>0.0000002787 ft<sup>2</sup>/mile<sup>2</sup></td> </tr> </table>  |   |  | <b>LWD</b>   | <u>0.3</u> m <sup>2</sup>  | <u>3</u> ft <sup>2</sup> | <b>Density of LWD</b> | m <sup>2</sup> /km <sup>2</sup> | 0.0000002787 ft <sup>2</sup> /mile <sup>2</sup> |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>LWD</b>   | <u>0.3</u> m <sup>2</sup>  | <u>3</u> ft <sup>2</sup>  |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |
| <b>Density of LWD</b>  | m <sup>2</sup> /km <sup>2</sup>  | 0.0000002787 ft <sup>2</sup> /mile <sup>2</sup>   |  |  |  |                          |                       |                                 |   |                   |                     |                 |   |                |                     |                                 |                   |                |                 |                                 |                         |                   |                 |                 |                         |                   |     |                 |     |                  |                  |      |     |     |                  |  |     |     |     |  |  |  |  |  |  |

|  |                 |  |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
|--|-----------------|--|--------------------------|--------------------------|--------------------------|---|--|--------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|---|
| <b>AQUATIC VEGETATION</b>                      |                 | Indicate the dominant type and record the dominant species present<br><input type="checkbox"/> Rooted Emergent <input type="checkbox"/> Rooted Submergent <input type="checkbox"/> Rooted Floating <input checked="" type="checkbox"/> None<br><input type="checkbox"/> Free Floating <input type="checkbox"/> Attached Algae <input type="checkbox"/> Floating Algae<br>Portion of the reach with aquatic vegetation present <span style="float: right;">0%</span>  |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>WATER QUALITY</b>                           |                 | Temperature <b>####</b> °C <b>n/a</b> 56.4    Water Odors<br>Conductivity    μs/cm <b>217</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum<br>Total Dissolved Solids <b>155</b> mg/l <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic<br>pH <b>6.1</b><br>Turbidity<br><input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slight Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other <input type="checkbox"/> Other<br>Water Surface Oils<br><input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks<br><input type="checkbox"/> Other |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>SEDIMENT/ SUBSTRATE</b>                     |                 | <b>Odors</b><br><input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand<br><input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Relic Shells <input type="checkbox"/> Other<br><input type="checkbox"/> Other<br><b>Deposits</b><br>Looking at stones which are not deeply embedded, are undersides black in color?<br><b>Oils</b><br><input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <input type="checkbox"/> Yes <input type="checkbox"/> No  |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>INORGANIC SUBSTRATE COMPONENTS</b>          |                 |  |                          |                          |                          |   |  |                          | <b>ORGANIC SUBSTRATE COMPONENTS</b> |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Substrate Type</b>                          | <b>Diameter</b> | <b>% Composite in Sampling Reach</b>   |                          |                          | <b>Substrate Type</b>    | <b>Characteristic</b>   | <b>% Composition in Sampling Reach</b> |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Bedrock  |                 |  |                          |                          | Detritus                 | Sticks, wood, coarse plant material   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Boulder  | >10"            |  |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Cobble   | 2.5 - 10"       |  |                          |                          | Muck-Mud                 | Black very fine organic matter  |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Gravel   | 0.1 - 2.5"      | 50   |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Sand   | gritty          | 20   |                          |                          | Marl                     | Grey, shell fragments   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Silt   | gooeey          | 20   |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| Clay   | slick           | 10   |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Habitat Parameter</b>                       |                 | <b>HABITAT ASSESSMENT - LOW GRADINET STREAMS</b>   |                          |                          |                          |   |  |                          |                                     |  |                          |                          |                          |  |                          |                          |                          |                                     |                          |                          |   |   |
|  |                 | <b>Optimal</b>   |                          |                          |                          | <b>SubOptimal</b>   |  |                          |                                     | <b>Marginal</b>  |                          |                          |                          | <b>Poor</b>  |                          |                          |                          |                                     |                          |                          |   |   |
| <b>1. Epifaunal Substrate/ Available Cover</b> |                 | Greater than 50% for low gradient streams) of substrate favorable for epifaunal colonization & fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat & at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).  |                          |                          |                          | 30-50% for low gradient streams) mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in form of newfall, but not yet prepared for colonization (may rate at high end of scale). |  |                          |                                     | 10-30% for low gradient streams) mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. |                          |                          |                          | 10% for low gradient streams) stable habitat; lack of habitat is obvious; substrate unstable or lacking. |                          |                          |                          |                                     |                          |                          |   |   |
| <b>Score</b>                                   | <b>2</b>        | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/>               | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |   |
|  |                 | 20   | 19                       | 18                       | 17                       | 16  | 15                                     | 14                       | 13                                  | 12   | 11                       | 10                       | 9                        | 8  | 7                        | 6                        | 5                        | 4                                   | 3                        | 2                        | 1 | 0 |

|   |           |   |   |   |  |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
|---|-----------|---|---|---|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|---|
| <b>2. Pool Substrate Characterization</b> |           | Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.     | Mixture of soft sand, mud or clay; mud may be dominant; some root mats and submerged vegetation present.  | All mud or clay or sand bottom: little or no root mat: no submerged vegetation.   | Hardpan clay of bedrock: no root mat or vegetation.  |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                          |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>3. Pool Variability</b>                |           | Even mix of largeshallow, large-deep, smallshallow, small-deep pools present.                                       | Majority of pools large deep; very few shallow  | Shallow pools much more prevalent than deep pools.  | Majority of pools small shallow or pools absent.   |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>2</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>4.Sediment Deposition</b>              |           | Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.   | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>14</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>5. Channel Flow Status</b>             |           | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                         | Water fills >75% of the available channel; or <25% of channel substrate is exposed.   | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.   | Very little water in channel and mostly present as standing pools.   |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>7</b>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |
| <b>6. Channel Alteration</b>              |           | Channelization or dredging absent or minimal; stream with normal pattern.   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.  | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.                        |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |                          |                          |                          |                                     |                          |                          |   |
| <b>Score</b>                              | <b>18</b> | <input type="checkbox"/>  | <input type="checkbox"/>  | <input checked="" type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |   |
|   |           | 20  | 19  | 18  | 17   | 16                       | 15                                  | 14                       | 13                       | 12                       | 11                       | 10                       | 9                                   | 8                        | 7                        | 6                        | 5                        | 4                        | 3                                   | 2                        | 1                        | 0 |

|   |          |   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
|---|----------|---|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7. Channel Sinuosity</b>   |          | The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered coastal plains and other normal low-lying areas. this parameter is not easily rated in these areas.)                                 |                          |                                     |                                     |                          | The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.  |                          |                          |                          |                          | The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.  |                          |                                     |                          |                          | Channel straight; waterway has been channelized for a long distance.  |                          |                          |                          |                          |
| <b>Score</b>  | <b>6</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   |          | 20  | 19                       | 18                                  | 17                                  | 16                       | 15   | 14                       | 13                       | 12                       | 11                       | 10   | 9                        | 8                                   | 7                        | 6                        | 5   | 4                        | 3                        | 2                        | 1                        |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing downstream.        |          | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.  |                          |                                     |                                     |                          | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.   |                          |                          |                          |                          | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.   |                          |                                     |                          |                          | Unstable; many eroded areas; "raw" areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>9. Vegetative Protection (score each bank)</b><br>Note: determine left or right side by facing downstream. |          | More than 90% of the streambank surfaces and immediate riparian zones covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. |                          |                                     |                                     |                          | 70-90% of the stream-bank surfaces covered by native vegetation, but one class of plants is not well represented disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. |                          |                          |                          |                          | 50-70% of the stream-bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining. |                          |                                     |                          |                          | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>10. Riparian Vegstative Zone Width (score each bank riparian zone)</b>                                     |          | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.   |                          |                                     |                                     |                          | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.   |                          |                          |                          |                          | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.  |                          |                                     |                          |                          | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.   |                          |                          |                          |                          |
| <b>Score (LB)</b>   | <b>7</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Left Bank   | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>Score (RB)</b>   | <b>8</b> | <input type="checkbox"/>  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|   |          | Right Bank  | 10                       | 9                                   | 8                                   | 7                        | 6  | 5                        | 4                        | 3                        | 2                        | 1  |                          |                                     |                          |                          |   |                          |                          |                          |                          |
| <b>TOTAL SCORE</b>  |          | <b>99</b>   |                          |                                     |                                     |                          |  |                          |                          |                          |                          |  |                          |                                     |                          |                          |   |                          |                          |                          |                          |